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Create a Project Timeline

Expert Planning Advice

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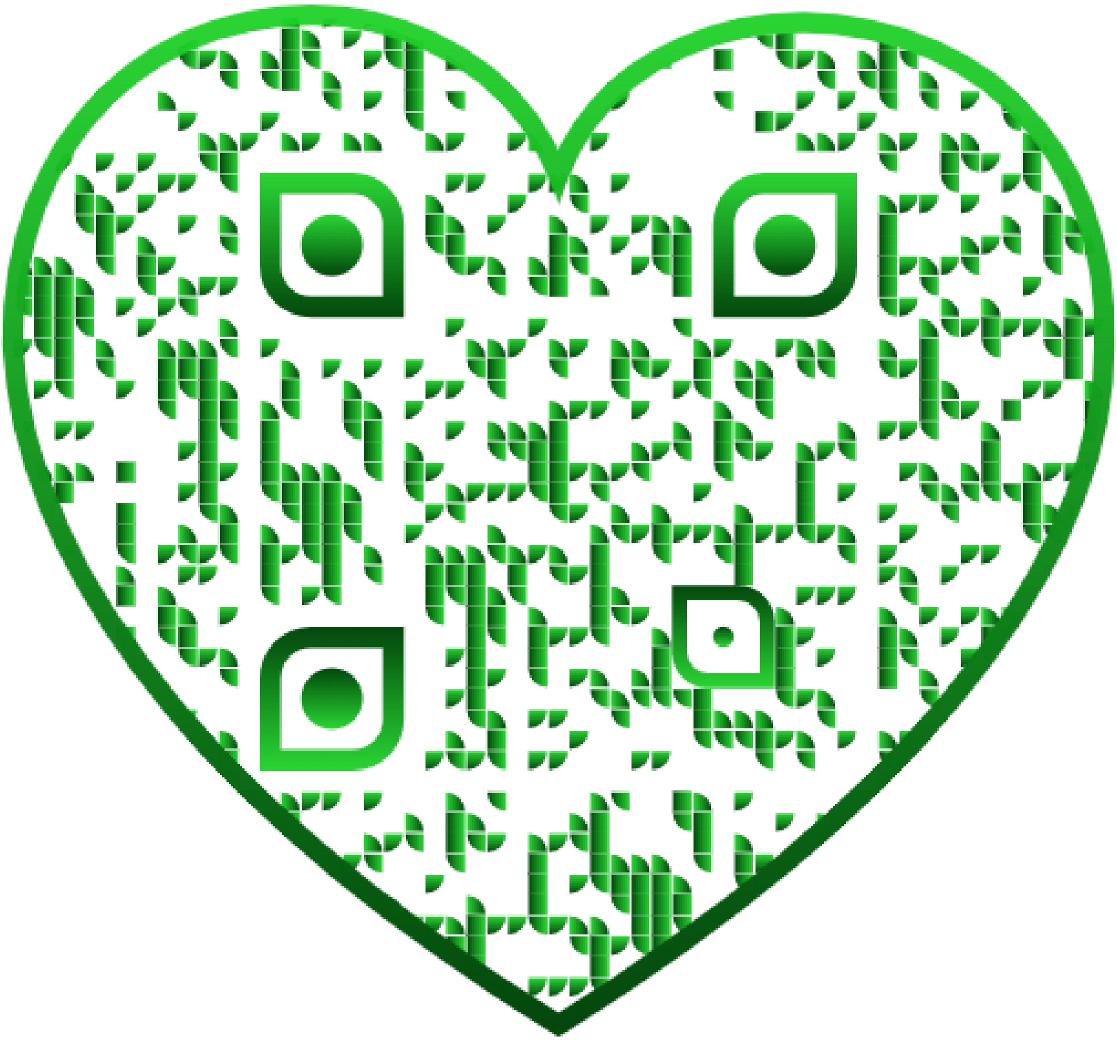
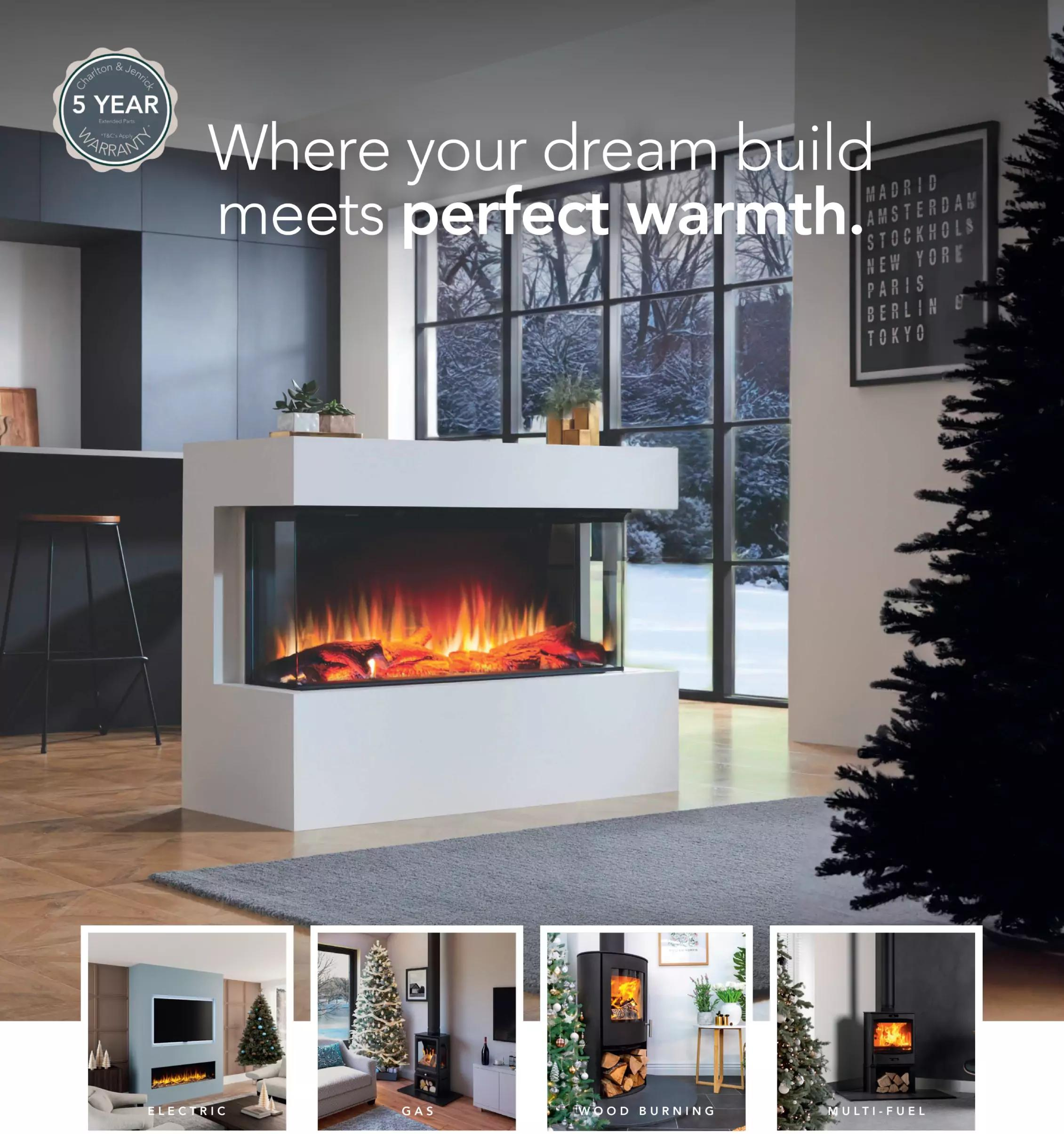
REAL-LIFE HOME BUILDS

Future-Proof Self Build | **Modern Extension to Former Mill** | **Replacing an Old Bungalow** | **Stunning Oak Frame Homes**

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Welcome

The Build It team was recently lucky enough to be invited to the launch of a new Retrofit Zone at the National Self Build & Renovation Centre in Swindon. The exhibit features three life-size building sections, demonstrating how to approach updating different house types. Regular readers will recall we ran an Eco Renovation Special in the October 2025 edition (see self-build.co.uk/complete-retrofit-guide), and I'm delighted the NSBRC is joining us in spotlighting retrofit. Much of our nation's housing stock is in dire need of upgrading. A strategic approach is vital to success – and independent resources like ours are essential for sharing valuable and impartial advice.

In this issue of the magazine, however, we're shifting focus to planning and realising a totally new and bespoke sustainable home. Designed to lead you through all the key decisions on your project journey, our Eco Self Build Special looks at what really goes into a sustainable home (page 64) and getting the thermal envelope right (page 68), before moving on to windows & doors (page 72), heating & comfort (page 78), renewable power (page 82), eco materials (page 88) and more.

We're also bringing you plenty of project inspiration – including Scarlett Deamer's pick of some of the UK's best recent oak frame builds (page 17), three fully-costed reader home projects (starting on page 24), Amandine Lefevre's look at stylish internal door design ideas (page 52) and architect Opinder Liddar's top tips for a high-quality barn conversion (page 92). You'll also find in-depth advice on everything from building with SIPs (page 48) to dealing with planning conditions (page 96), low-carbon brick construction (page 98) and external wall insulation options (page 102).

Chris

CHRIS BATESMITH, CONTENT DIRECTOR

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Planning a great construction timeline

Project manager Mark Stevenson sets out what you need to know to develop a self build construction programme you can rely on

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DEFINING AN ECO HOME

Energy efficiency and airtightness should come as standard when building from scratch in 2026, so what truly makes a project 'eco'? Here, Nigel Griffiths explores the sustainable solutions we should be integrating in our new homes and how you can push things further

COVER IMAGE: THE TONKS IS A STUNNING COUNTRYSIDE HOME BY WELSH OAK FRAME (PAGE 21). PHOTO: NIKHILESH HAVAL

MEET THE TEAM

SANDER TEL is Build It's digital editor. Alongside putting together lots of inspiring content at self-build.co.uk, he regularly contributes in-depth articles for the magazine.

SCARLETT DEAMER is Build It's editorial assistant. This month she's gathered an inspiring selection of oak frame homes (page 17) and looks into why a SIPs build could be for you (page 48).

AMANDINE LEFEVRE is Build It's editorial assistant. From page 9, she's sourcing the latest news, products and materials. On page 52, she's investigating how to choose internal doors for your home.

JULIAN OWEN is Build It's design doctor and a self build architect with his own practice. He is a regular expert at Build It Live. Read more from Julian at self-build.co.uk/julian.

OPINDER LIDDAR is a Build It Award-winning architect and director of Lapd Architects. Over on page 92, he's sharing what you need to know when designing a barn conversion.

MARK STEVENSON is a project manager with years of experience in the construction industry and is the current chair of NaCSBA. Read his guide to sequencing a build on page 60.

ALAN TIERNEY is a historic buildings expert and conservation specialist. For advice on your heritage project, speak to him at Build It Live or check out his articles at self-build.co.uk/alan.

MARTIN GAINE is a former council case officer turned independent planning consultant, and a regular expert at Build It Live. Read his expert tips for planning conditions on page 96.

NIGEL GRIFFITHS is Build It's sustainability expert, specialising in eco homes and renewable energy. This month, he's discussing how to choose eco-friendly bricks for your home build project (page 98).

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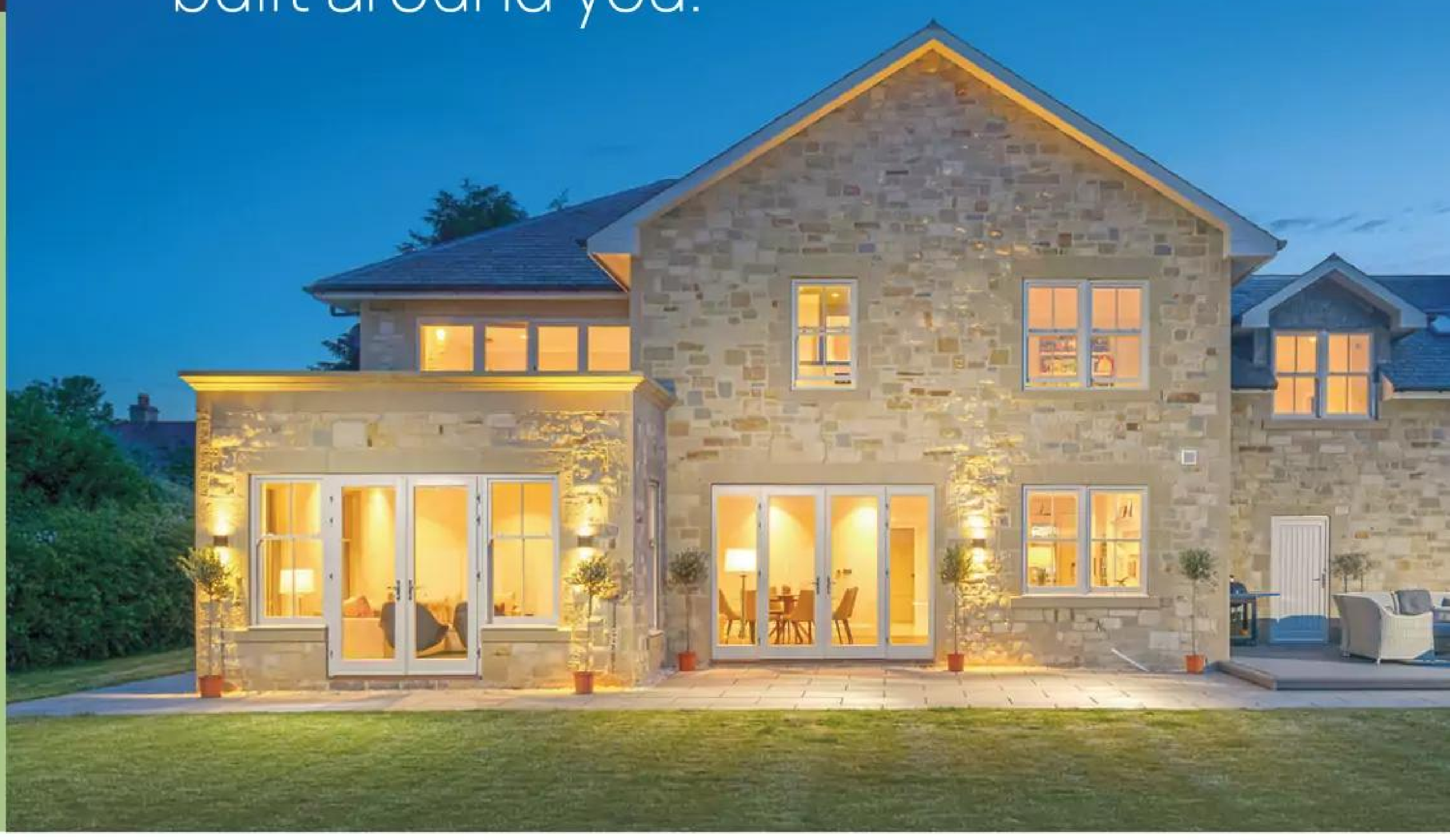

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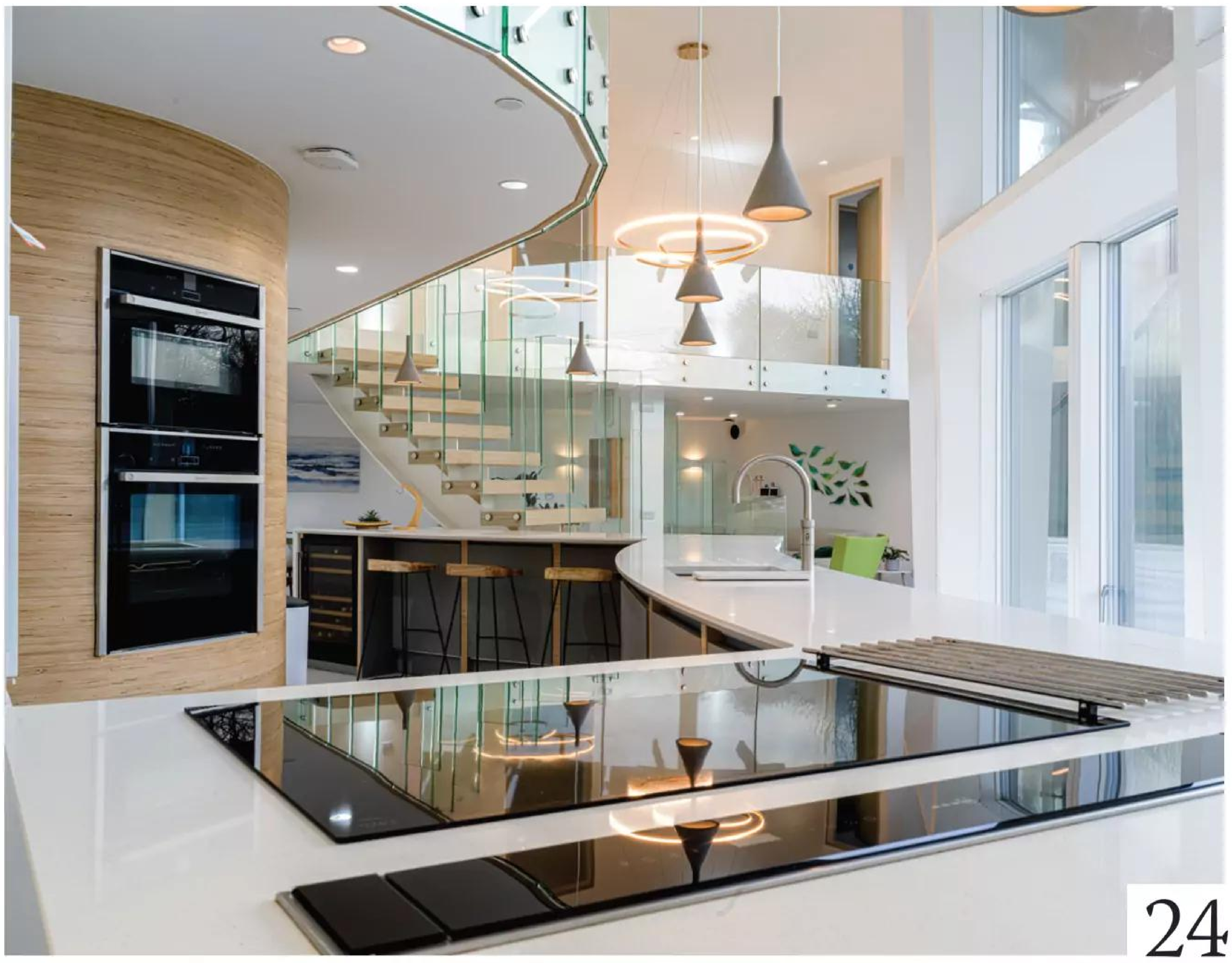

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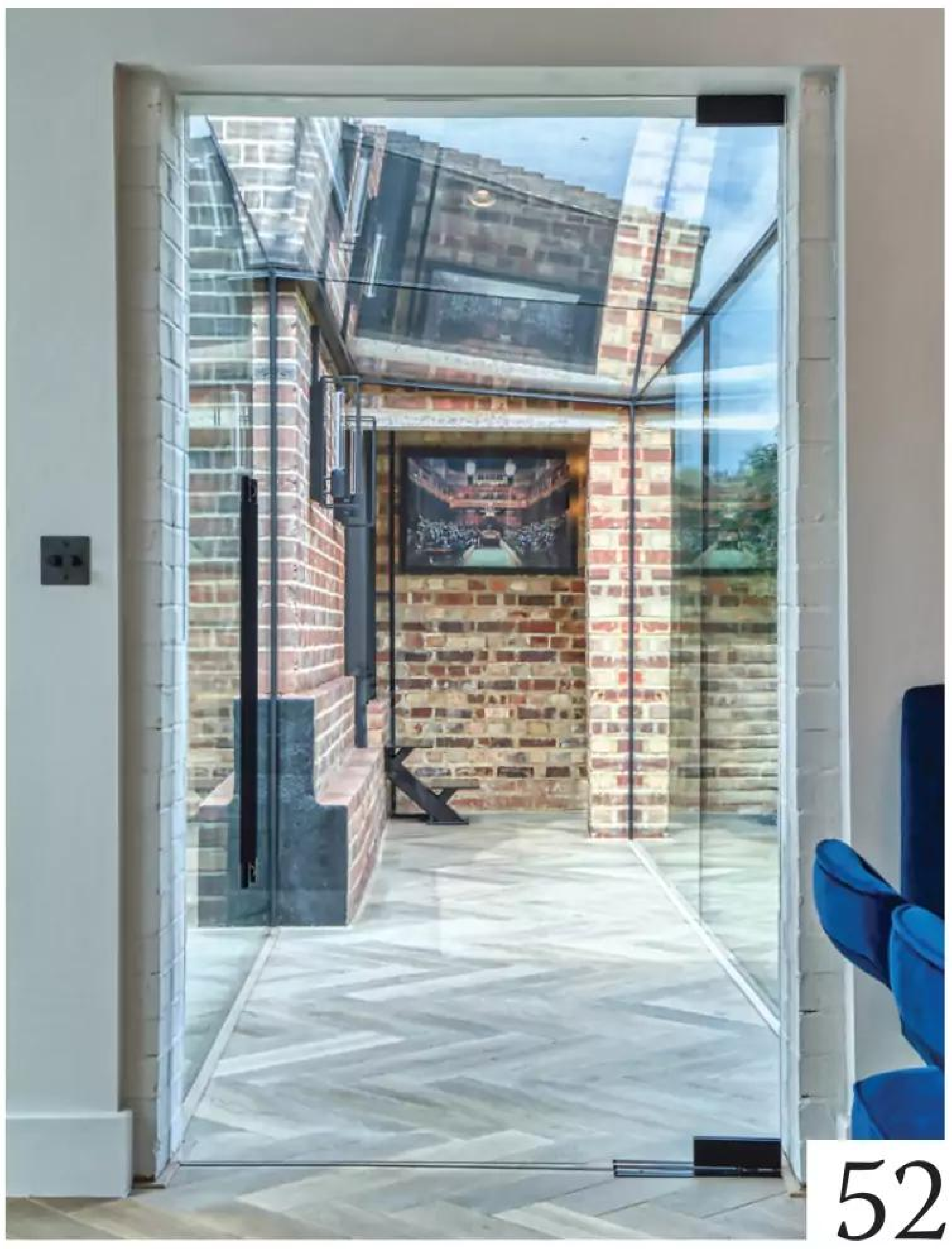

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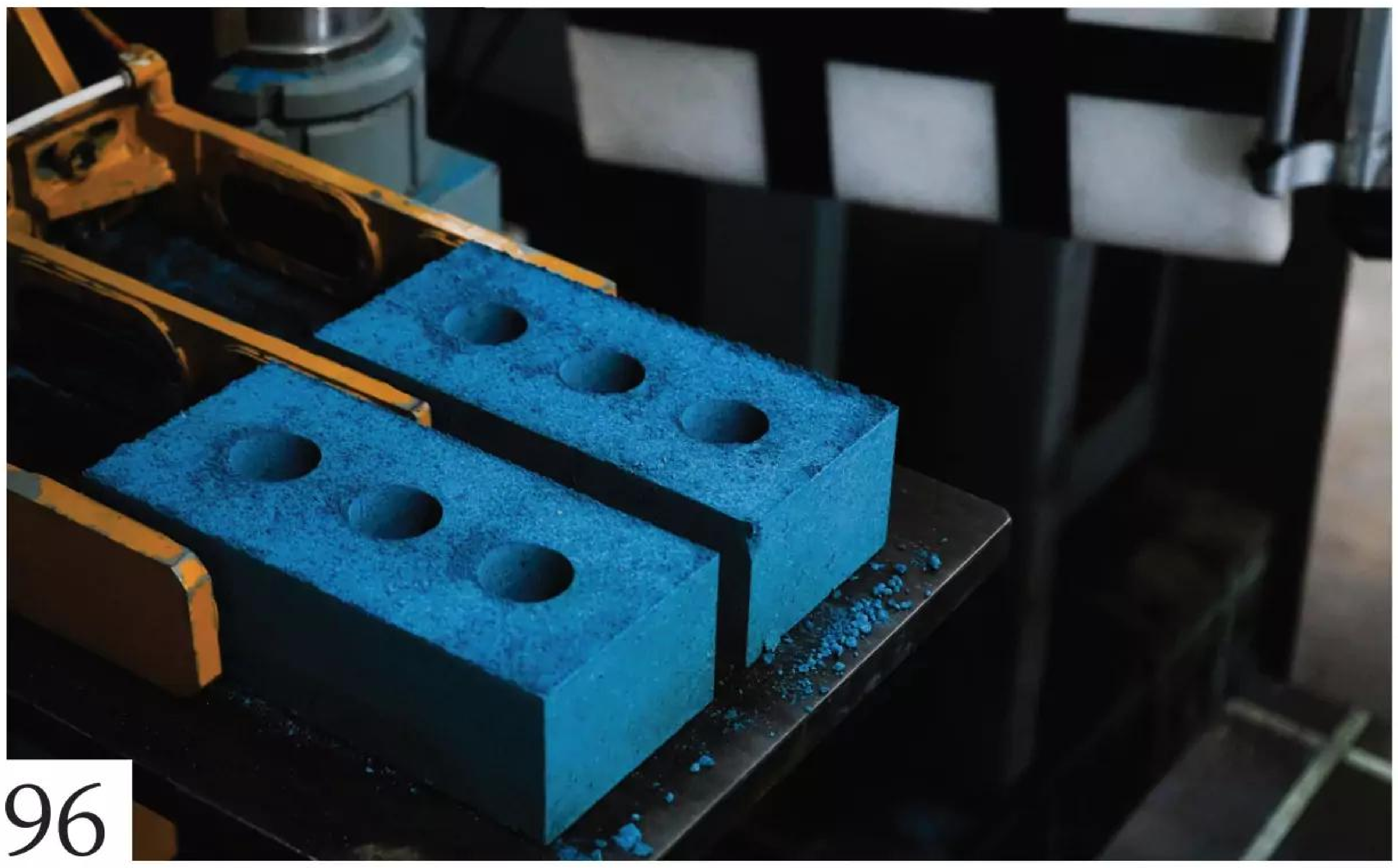
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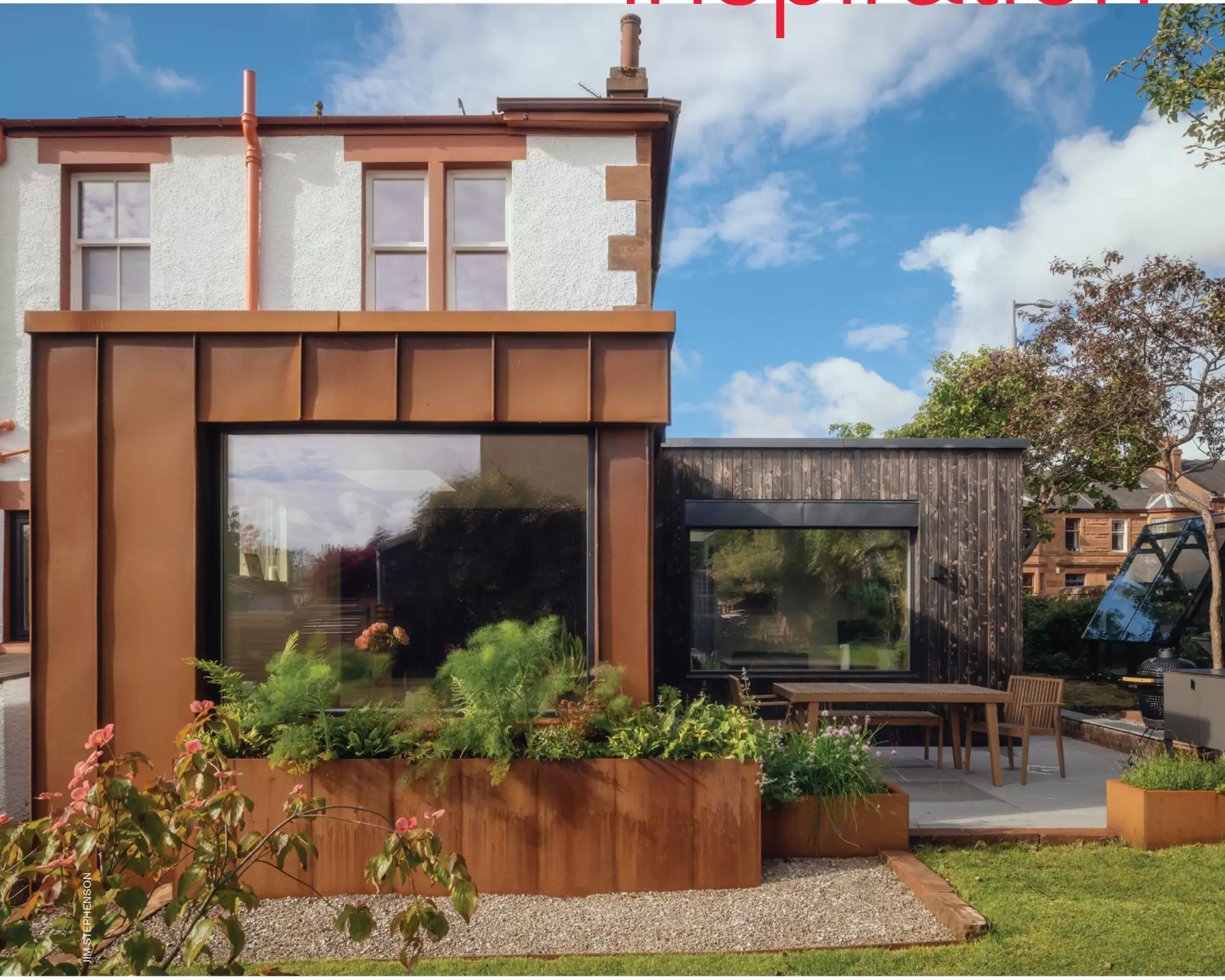
JIM STEPHENSON

Sustainable retrofit to sandstone home

Loader Monteith carefully restored and extended this 19th-century home in the heart of Glasgow. The owners sought to rectify the disconnected interiors, remove the property's reliance on gas, improve the house's relationship with the garden and make better use of a 1970s side extension.

The project centred on a generous ground-floor rear extension and complete refurbishment. The side addition was transformed into a bright, light-filled living area, while the rest of the existing ground floor was stripped back to brickwork and rebuilt with a chic additional extension, forming a spacious kitchen, living and utility spaces.

To retain the home's historic charm, the original exterior stone wall was preserved and fitted with a double-sided fireplace. Designed by the homeowner, the kitchen is crafted in birch plywood and finished with dark Indian ink. The interior palette is natural and muted with non-toxic finishes creating a tranquil and healthy environment.

Externally, the new additions are finished in Corten steel and burnt larch, offering a warm counterpoint to the red sandstone and render. Expansive glazed openings frame views of the rear garden, where mature pear and apple trees, a kitchen garden and a greenhouse built from salvaged glass create a peaceful outdoor haven.

A highly efficient air source heat pump, breathable wood fibre insulation and airtight construction have reduced energy use to less than a third of what they were previously. An eco-friendly green roof sits upon the new extension, enhancing biodiversity on the site.

To find out more call 01413 700887 or visit loadermonteith.co.uk

PROJECT OF THE MONTH

Light-filled barn conversion

by Watershedd

Burrowed within the picturesque landscape of Surrey Hills National Park, this newly converted barn offers a modern take on traditional architecture. Watershedd delivered an extensive transformation of the site, thoughtfully converting the existing agricultural structures into a single family home, all while preserving its original character.

The property's location within a National Landscape and protected green belt, combined with its status as a local heritage asset, influenced the project's design and scope. While it wasn't officially listed, there was a strong emphasis on restoring the barn's original features wherever possible. The design sought to integrate the surrounding environment by incorporating natural materials throughout, notably an exposed oak frame structure, vaulted ceilings and the original stone walls. Large, glazed pivot doors were also fitted within the oak frame to flood the interior with natural light and reinforce the panoramic views of the garden.

Externally, the dwelling retains the character of a traditional Surrey barn, combining local reclaimed stone, timber cladding and natural lime plaster. The large glazing stands out as one of the home's most contemporary features. New black timber cladding and a polished concrete floor were incorporared into the design to add a touch of luxury to the interiors, harmoniously blending modern elements with the barn's historic charm.

For more information call 020 3576 0221 or visit watershedd.com

NSBRC launches retrofit hub

The National Self Build & Renovation Centre (NSBRC) has opened its new Retrofit Zone, an immersive exhibition demonstrating ways to upgrade your home. The display features life-size cross-sections representing different types and ages of homes found in the UK, showcasing the challenges commonly associated with them. Homeowners are invited to learn about the solutions best suited to their property and household needs, with an emphasis on going fabric first.

5.5%

of UK homeowners are heating their homes with air or ground source heat pumps – according to a recent survey by Mitsubishi Electric and Opinion Matters – a figure that is amongst the lowest in Europe. A further 33% would consider switching to a heat pump if electricity costs were the same as or less than gas; while 15% said they would only make the change if their annual energy bill would be £500 cheaper – furthering calls for utility prices to be re-balanced.

FMB president calls for licensed trades

The new FMB president has highlighted the immediate need to improve retrofit standards, following a visit to a state-of-the-art Victorian terrace retrofit in York. The property is part of YorEnergy, which has secured £3.37 million in funding from Innovate UK, and will become a home for social housing tenants. The FMB's research suggests over £14bn has been lost to rogue builders over the last five years and is calling for building companies to be licensed to ensure best practice.

What's on?

INTRODUCTION TO JAPANESE JOINTS

5th JAN
£390,
LONDON

Elevate your joinery with this Japanese woodworking session aimed at beginners.

thegoodlifecentre.co.uk

GUIDE TO SELF BUILD PROJECTS

9th-11th JAN
£395,
SWINDON

Learn the basics of self building in this three-day course, covering a range of essential topics.

nsbrc.co.uk

RENEWABLES: WIND TURBINES

10th JAN
£125,
MACHYNLLETH

Decide if a wind turbine suits your needs and see how the tech compares on costs and carbon.

cat.org.uk

DIY IN A DAY: DRILLS

18th JAN
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thegoodlifecentre.co.uk

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CHRIS SNOOK

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need to know

Tracking your consutructions costs

Good cost tracking is vital for a successful building project. The best place to start is by creating a detailed budget and breaking it down into project categories (using a spreadsheet, such as Microsoft Excel, could be a helpful tool for this):

- **Pre-construction:** Planning, design, surveys and consultant fees.
- **Site preparation:** Temporary fencing, site clearance/grading and site set-up.
- **Substructure works:** Excavation, foundations/slab, foul and storm drainage.
- **Superstructure works:** Scaffolding, framing, brick and blockwork, roofing and exterior finishes.
- **Internal works:** MEP (mechanical, electrical and plumbing), plaster boarding, plastering, decoration, wall/floor tiling, carpentry, kitchens, appliances and sanitaryware. Remember to include any green technology such as air source heat pumps, solar PV etc.
- **FF&E (furniture, fixtures and equipment):** Cabinet joinery, mirrors, vanity units, bathroom accessories, furniture and carpets.
- **External works:** Hard and soft landscaping including paths, patios, driveways, fencing, gates, turf and planting. This may also include works for ecological systems, such as Rainwater Harvesting.

Main contractor or trade-by-trade tenders, quotations and estimates should be detailed and itemised, including materials, labour, plant or tool hire, overheads and profit. They should also specify how long the tender, quotation or estimate stays open for acceptance and the period for which the price is fixed.

Put a contract in place, such as JCT, that outlines the full duration of the project as well as the payment terms, taking into account the payment frequency, retention of monies and a schedule of works. Agree on a process for managing variations or design changes, including obtaining approval before any work begins and addressing any associated cost implications that could crop up later on.

Other areas to monitor closely are non-construction costs, such as utilities, interest on loans/mortgages, building control fees, warranties and insurance. These should be factored into the master budget plan from the outset.

Factors that can significantly impact a budget include poor site access, adverse ground conditions, weather delays, material price fluctuations and procurement lead-in times

You should always include a contingency for unforeseen costs. Setting aside 10% of the total budget is what I would recommend as a general guideline.

JANE GEE

is senior commercial manager at CLPM, a construction project consultancy. She has worked in the construction industry for over 35 years and her expertise covers a range of areas, including estimating, procurement, surveying, financial analysis and cost reconciliation. **(cl-pm.com)**

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This engineered oak flooring combines the timeless quality of wood with a low-maintenance, high-quality finish. A substantial 20mm thickness and 6mm wear layer ensures durability. Venice Luxe natural oak engineered wood flooring, £116.06 per m², storiesflooring.co.uk

£32.49 per m²

Embracing the rich history of the chevron motif, this wood-effect laminate flooring adds the character of oak without the hefty price tag. Water resistant and easy to install for long-term comfort. Impressive Patterns chevron oak laminate floor, £32.49 per m², quick-step.co.uk

product news

Great shopping ideas for your custom home project

OVERHEAD GLAZING

Featuring a laminated inner pane for safety and a thermally-broken aluminium frame, this stylish, high-performance rooflight keeps warmth in and noise out while flooding the room with natural brightness. **Select flat glass rooflight, starting from £343, keyliteroof-windows.com**

RESIN MORTAR SYSTEM

Designed for brick slips and stone cladding, this new cement-free mortar offers a cleaner, quicker and more eco-friendly way to achieve professional results thanks to its use of a low-carbon binder. **Pointing Made Easy, £68 per tub, brickslips.co.uk**

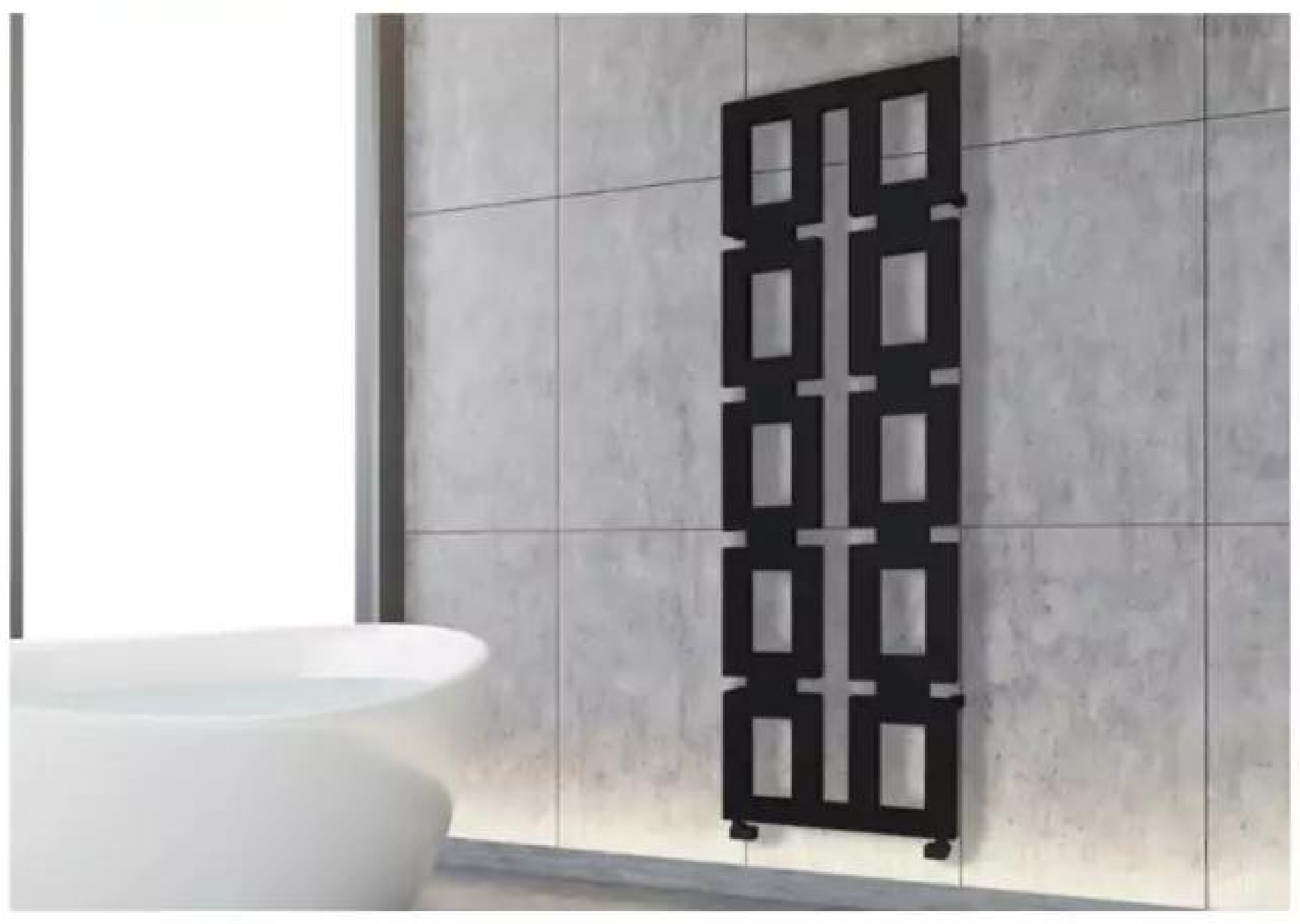
SLEEK FINISH

This wood-effect ceramic panelling brings the warmth and character of timber in a low-maintenance finish. Resistant to steam, stains and water, it can be used effectively in all areas of the home. **Oslo oak fluted wall tile, £49.95 per m², porcelain superstore.co.uk**

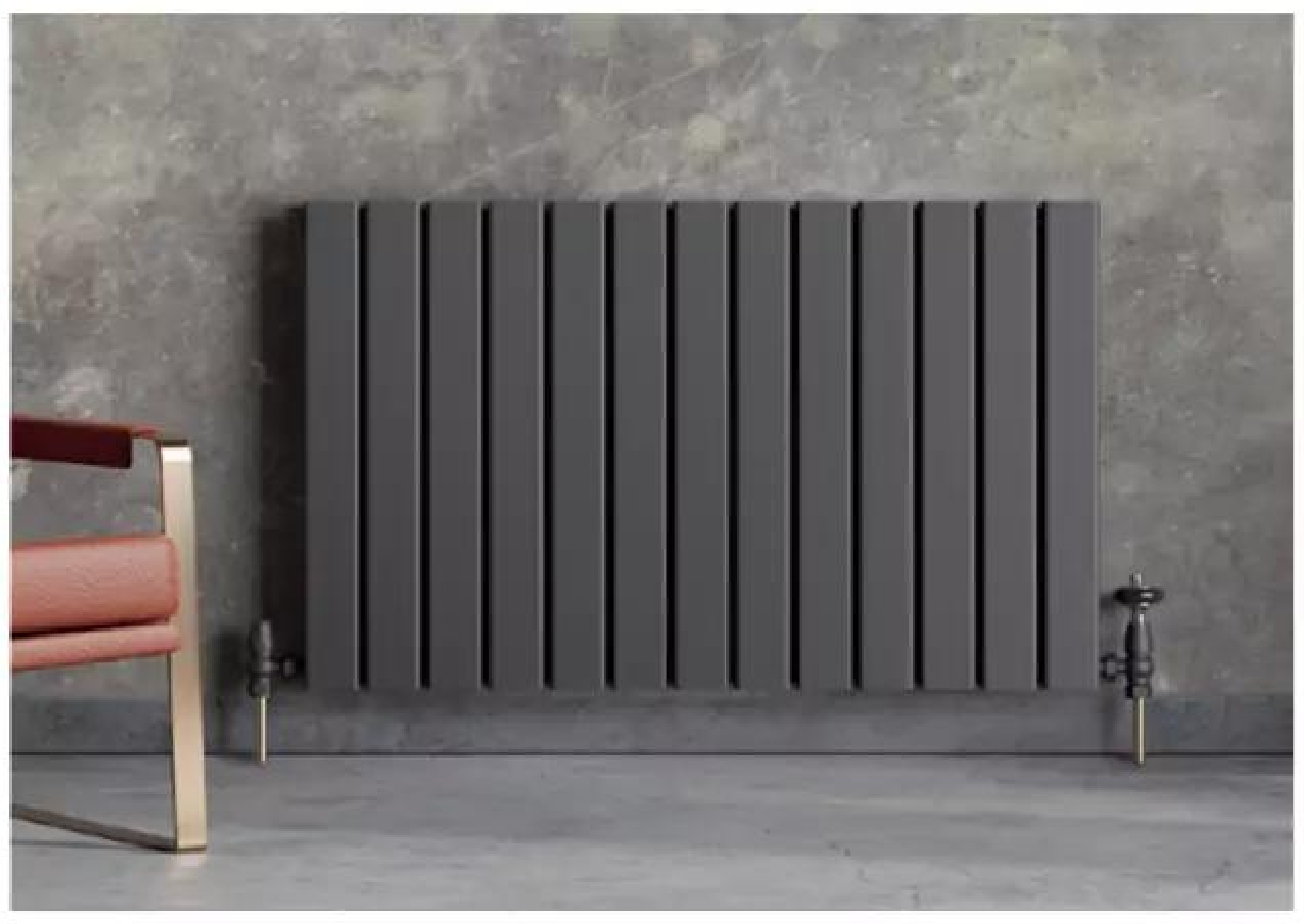
BATHROOM BRILLIANCE

With soft square edges and a slightly kicked lever, this basin mixer combines style and durability to adapt to a variety of bathroom schemes. It's also designed for quick, easy at home fitting. **Cubeo single-lever basin mixer in matt black, £187.40, grohe.co.uk**

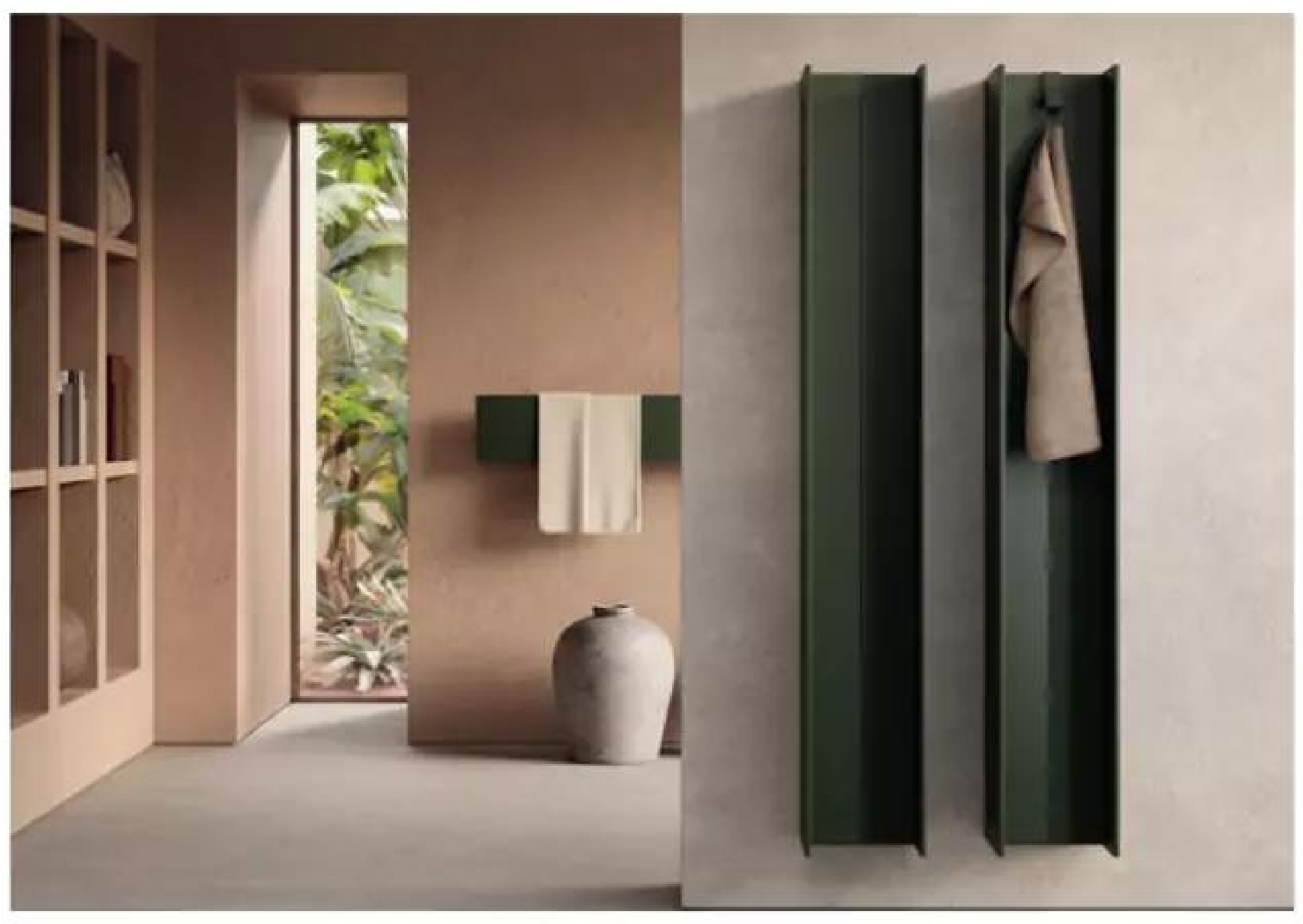
3 of the best DESIGNER RADIATORS



1 *Radox Inka designer radiator in matt black, 1,700mm x 580mm,* **£1,446.90, sanctuary bathrooms.co.uk**



2 *Anthracite designer radiator, 600mm x 984mm,* **£299.95, renaissance athome.co.uk**



3 *Serie T1P designer radiator, 1,006mm x 230mm, starting from* **£988.80, theradiatorcentre.com**

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interiors notebook

Bring depth to your home with a burnt orange and burgundy colour palette that evokes a rich and timeless charm

1

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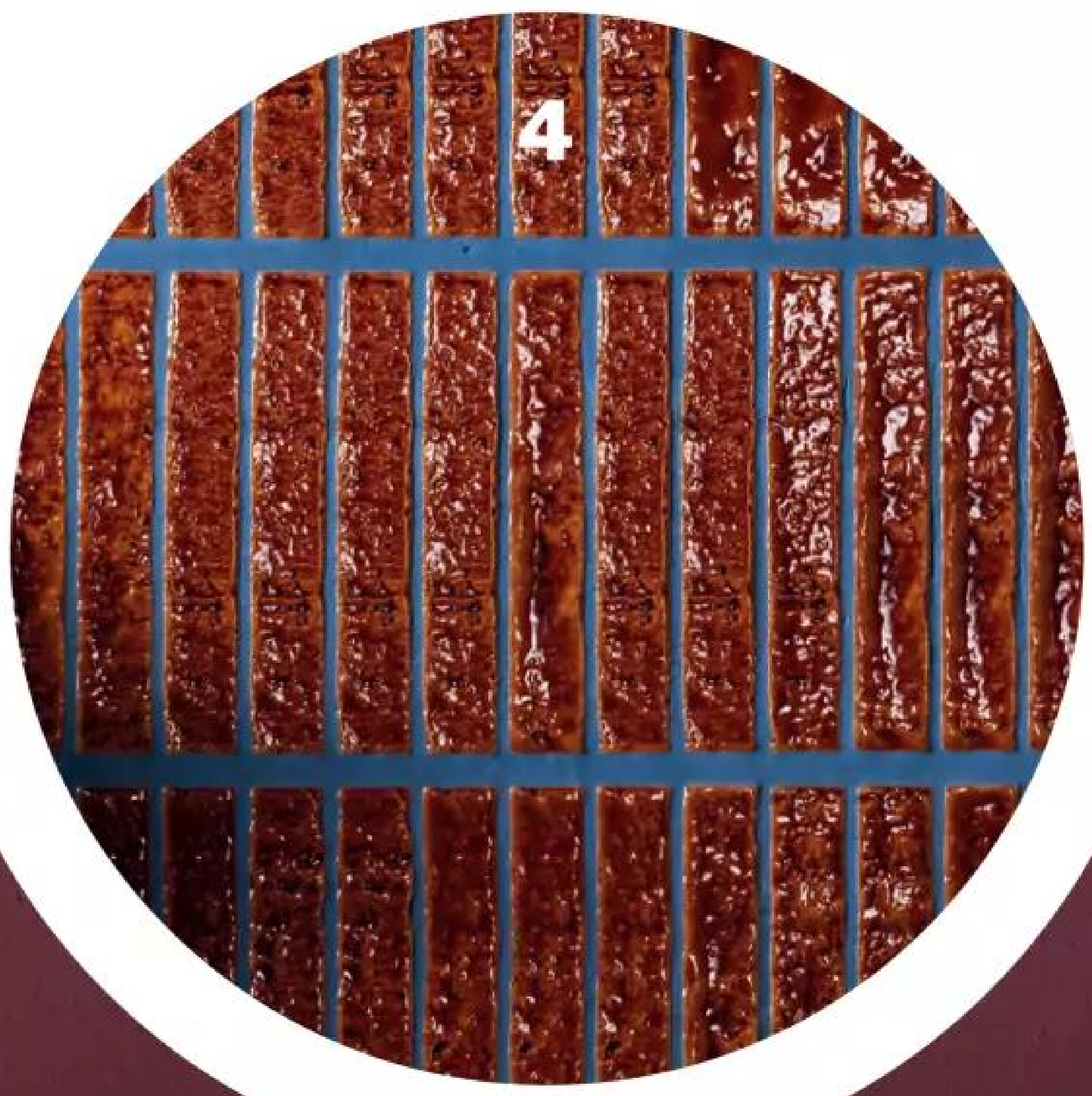

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Shopping list

1 *With a low back and a generous seat cushion, this sofa is inspired by Italian design for deep, slouchy comfort.* **La Dulce sofa large in Sticky Toffee Clever Velvet, £3,295, loaf.com**

2 *Reimagining the look of office filing cabinets, this chest of drawers sets itself apart through its refined, sophisticated details.* **Dita chest of drawers in terracotta brown, from £2,539, ligne-roset.com**

3 *This cooker blends classic elements with clean lines for a modern aesthetic that still feels timeless and functional.* **Estel Deluxe induction range cooker in Bordeaux, £3,999, rangemaster.co.uk**

4 *These tiles are inspired by Brutalist architecture to add a contemporary twist to a warm, rustic interior.* **Rapture Crackle burnt orange tile, 3.8cm x 23.5cm, £89.77 per m^2, bakedtiles.co.uk**

5 *Manufactured from coated concrete, this basin is resistant to stains and scratches to maintain its sleek finish.* **Harbour concrete wall-hung cloakroom basin in brick red, £199.99, drench.co.uk**

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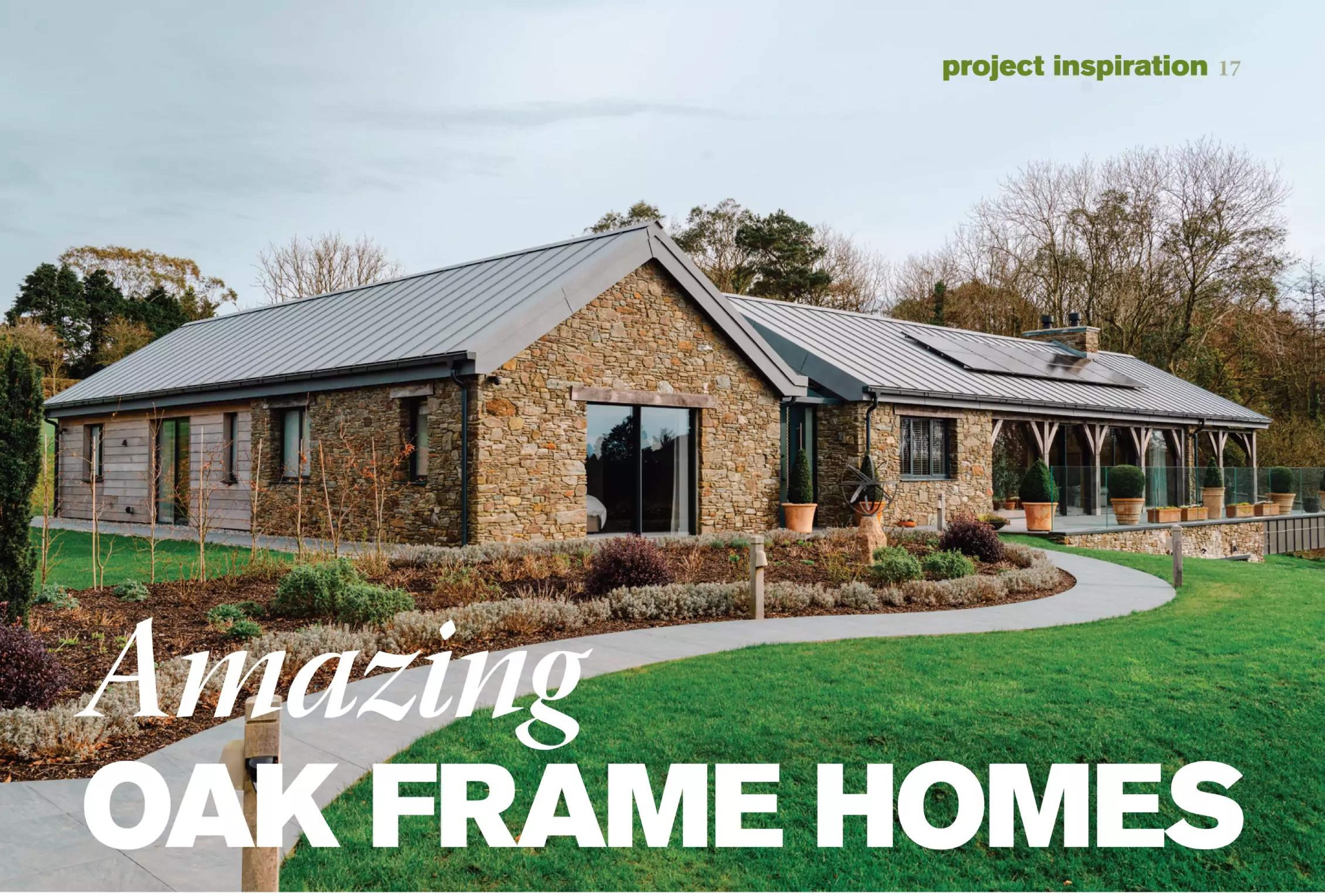
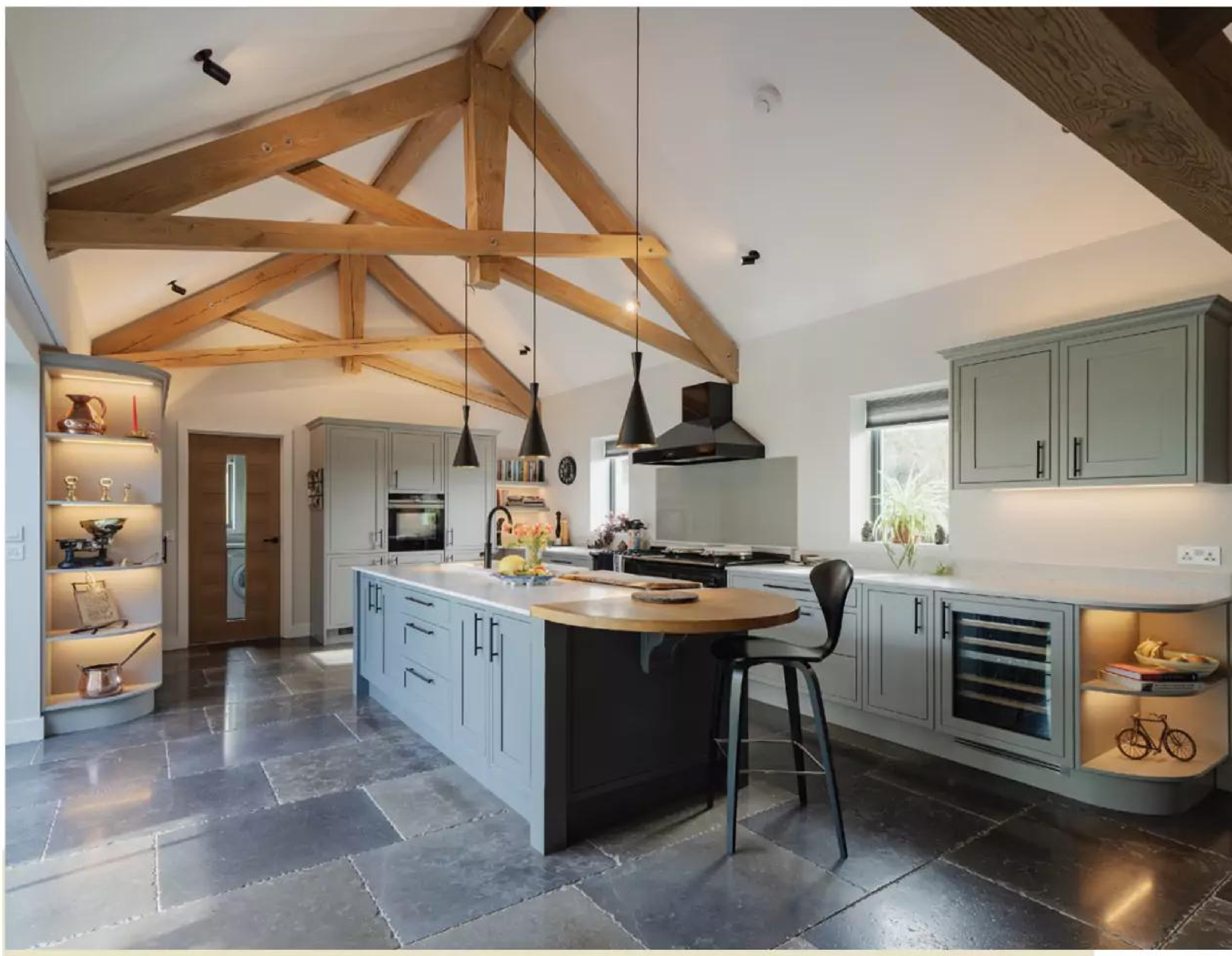


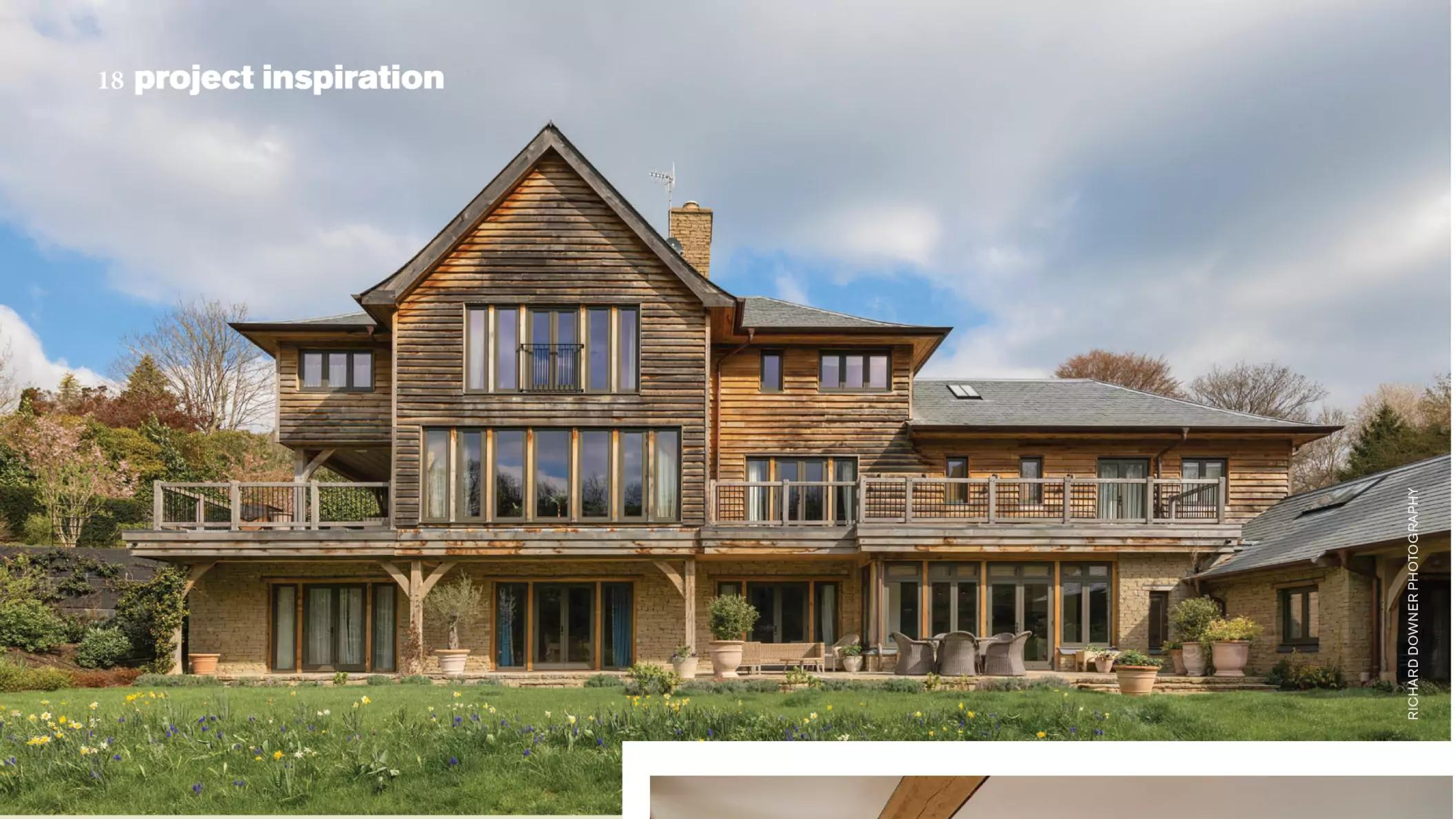
Amazing OAK FRAME HOMES

Blending natural charm, warmth and strength, oak remains a versatile solution for self builders. From rustic retreats to contemporary family homes, **Scarlett Deamer** looks at eight inspiring real-life designs



HARMONIOUS DESIGN

Set within the rolling landscape of South Devon, this beautifully crafted house was designed and created by Carpenter Oak and BBH Architects (www.bbharchitects.co.uk). A total of 10 scissor trusses span the living and kitchen areas, forming a dynamic T-shape while bringing a modern twist to the material. The oak continues beyond the interior, expressed through a series of exterior posts set on granite saddle stones that complement the stone-clad walls and zinc roof. These flow into two further trusses, creating a sheltered outdoor entertaining space. A glazed entrance, cedar cladding and courtyard garden complete this scheme. **(www.carpenteroak.com)**


RICHARD DOWNER PHOTOGRAPHY

CLASSIC CHARM

This split-level replacement home, designed by Roderick James Architects, features a stunning three-storey green oak frame, which forms the structural heart of the interior and gives the house its natural warmth and character. Externally, oak weatherboarding, stone plinths and slate roofs help the building merge seamlessly with the wooded valley and local architecture. A raised balcony and tiered garden levels connect the rooms to the landscaped surroundings. Designed and built to maximise passive solar gain and insulation levels, the home also features an air source heat pump, mechanical ventilation with heat recovery (MVHR), rainwater harvesting and solar panels for added energy efficiency. **(www.rjarchitects.co.uk)**

BUILDING AN OAK FRAME HOME YOUR FAQs ANSWERED

GARETH EDMUNDS, design director at Welsh Oak Frame, looks at what you need to know about this build system

Q Is oak an expensive build method?

Contrary to popular belief, building with an oak frame isn't as expensive as you might think. It generally adds around 20% to the overall structural costs, but there are multiple ways you can keep prices to a minimum. For example, working with an experienced designer from the start will help avoid issues further down the line and make the most of what oak can offer, both in terms of aesthetics and structural capabilities.

Another way to bring build costs down is to adopt a hybrid approach, using softwood framing in some areas and natural oak where you want to showcase the material for the most visual impact – such as when creating a double-height entrance hall, large vaulted ceiling or a luxurious, cosy living room with low beams.

Q Is there a difference between green and seasoned oak?

Green oak's high moisture content allows the timbers to move when they're first fitted. Over time they season and settle down, improving the structural integrity of the building as well as enhancing its natural character. Green oak is the only way forward when it comes to frames, roof trusses, beams and posts. The soft wood is easier to cut and shape to exact sizes.

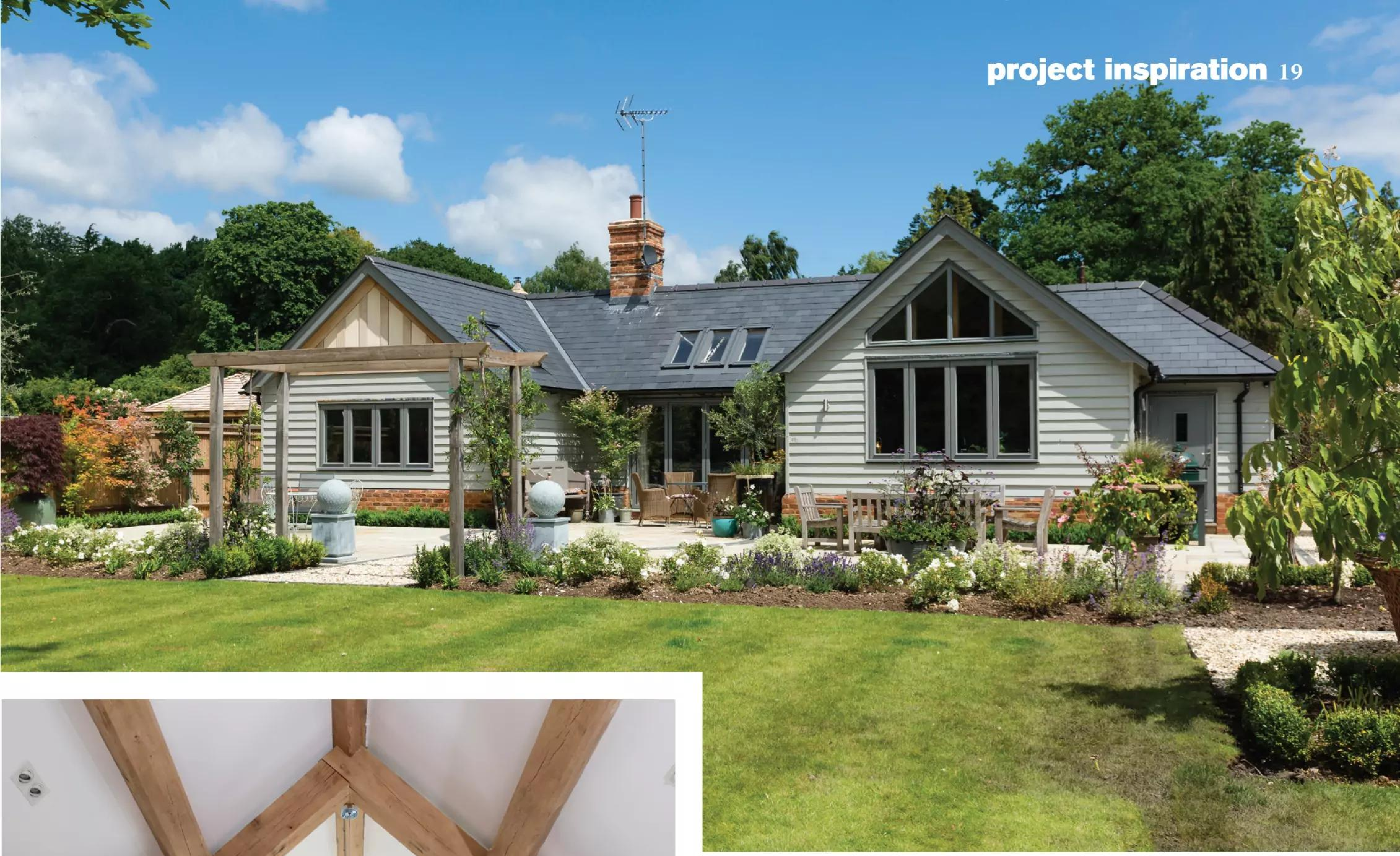
Air-dried oak has already cured a little and developed the cracks and splits that occur during the drying out process. It works well if movement needs to be minimal and when thicknesses of 75mm or less are required – for example, lintels, glazed panels and window frames. It isn't recommended for oak framing where timbers need to be 100mm thick or more.

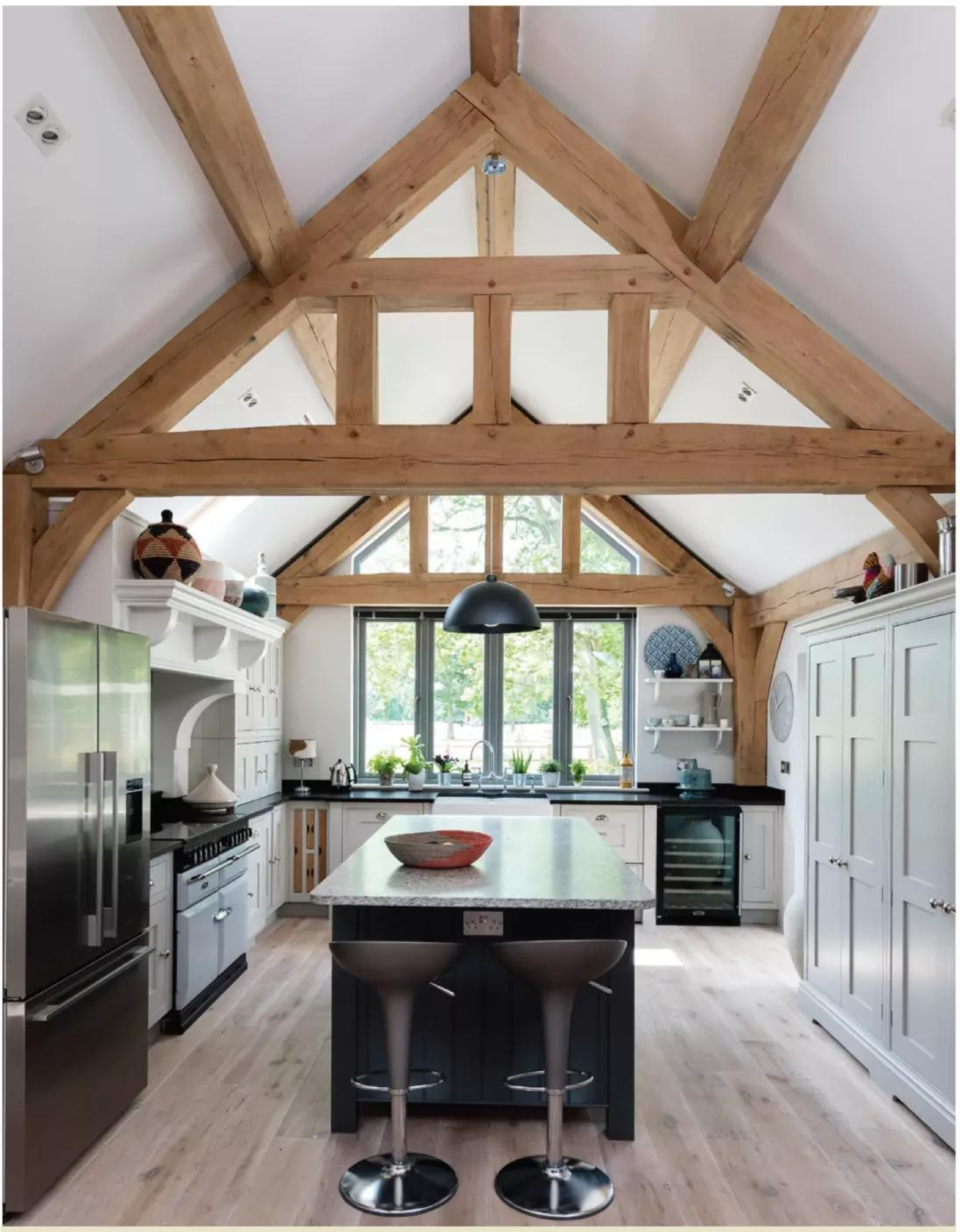
Q What are the sustainable credentials of oak frame?

Cutting down trees might sound like a bit of a contradiction, but in a sustainably managed woodland, suppliers will plant more trees than they fell to create the frame. Look for oak with PEFC and FSC accreditations, which guarantee that the wood comes from a sustainable source.

Offsite manufacture combined with the skills of the craftspeople in the oak frame workshops ensure that – compared to traditional site-led methods – far less waste is produced when constructing your home. Workshop teams select the right piece of oak for the right job. The frame is built with precision inside the workshop, labelled and erected on site. Off-cuts are sometimes used I in a workshop's woodburner. Oak is also a biodegradable building material and will naturally be broken down at the end of its lifespan.

Another reason oak is sustainable is because it is a natural insulator. Self builders can also fill the walls with eco-friendly insulation such as sheep's wool or cellulose. A warm house in winter and a cool house in summer means using less fossil fuel for heating and cooling and creating fewer CO2 emissions.

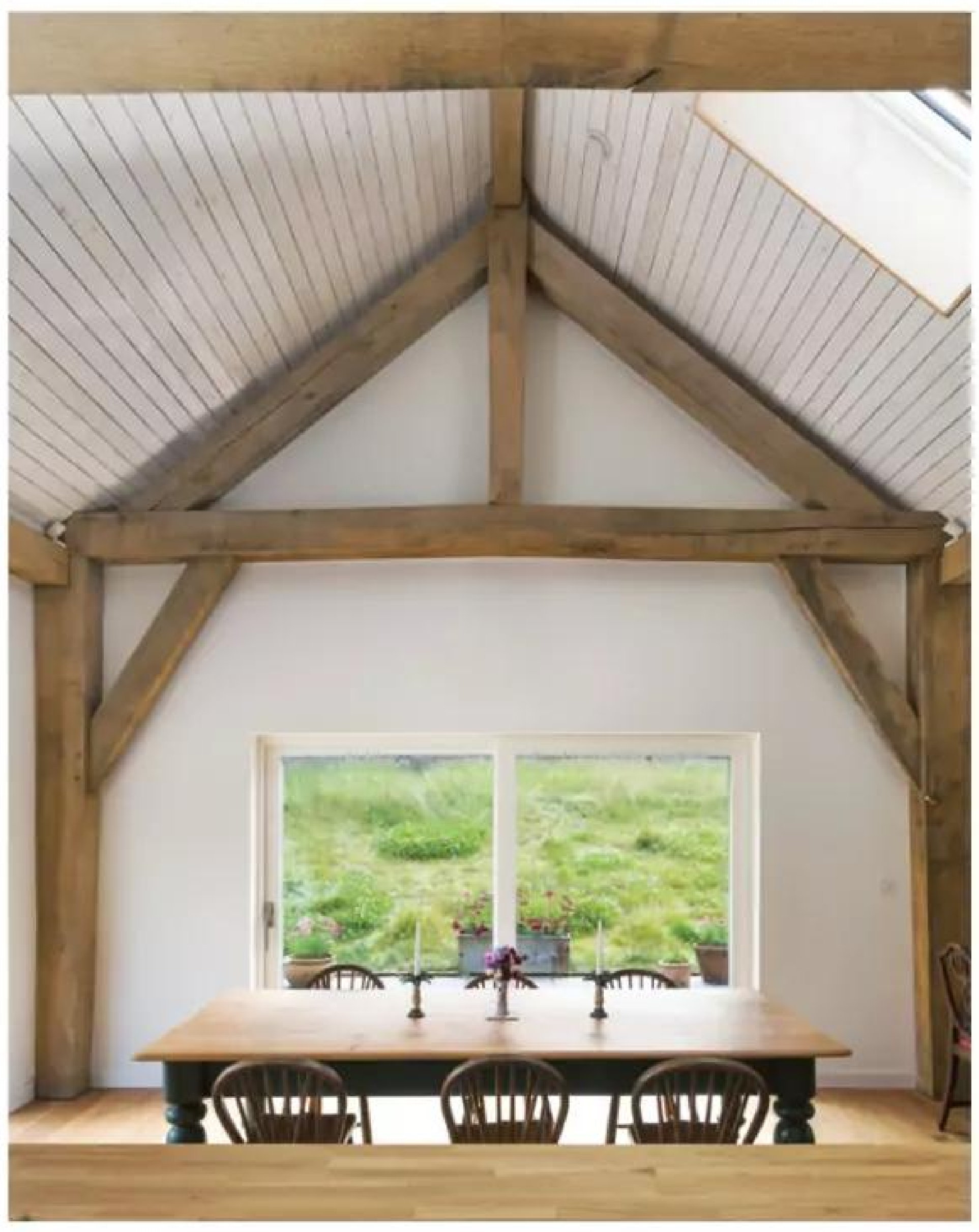




TAILOR MADE

Designed by Border Oak, this single-storey home replaces an old cottage on a leafy Surrey lane and maximises its connection to the surrounding meadows. The property features a beautiful vaulted interior supported by an internally-exposed oak frame, while grey painted weatherboarding, a deep brick plinth and a slate roof blend the home into its rural setting. Large windows and central bifold doors link living spaces to the garden. Thoughtful planning separates the bedroom wing from the family and kitchen areas for a functional and flexible layout. **(www.borderoak.com)**

ANTHONY GREENWOOD



SECRET GARDEN

This project by KAST Architects features a modest, single-storey oak frame divided into two barn-style structures, linked with a glazed entrance. The main barn opens to the luxurious south-facing garden and includes an open-plan kitchen, dining, living area and the master suite. The smaller volume aligns with the historic garden wall and houses bedrooms, a family bathroom and utility space. Exterior finishes include thermally-modified timber cladding and a profiled metal roof. With high insulation, airtightness detailing, solar PV panels and a ground source heat pump, the home is both energy efficient and comfortable. **(www.kastarchitects.com)**

CRAFTED WITH CARE

In the heart of an Essex vineyard, this heritage-inspired farmhouse celebrates sustainable building and timeless rural design. Created by Scabal and Kay Pilsbury Thomas Architects (www.scabel.net; www.kpt.co.uk), with a handcrafted oak frame by Westwind Oak, the three-storey home features a striking Dutch-style gable roof and expansive open interiors. A glazed gable on the upper floor frames panoramic countryside views, while straw bale insulation delivers exceptional thermal performance and breathability. Inside, smooth bare plaster walls complement the rustic texture of the exposed oak beams. **(www.westwindoak.com)**

BERNADETTE BAKSA

NIKHILESH HAVAL

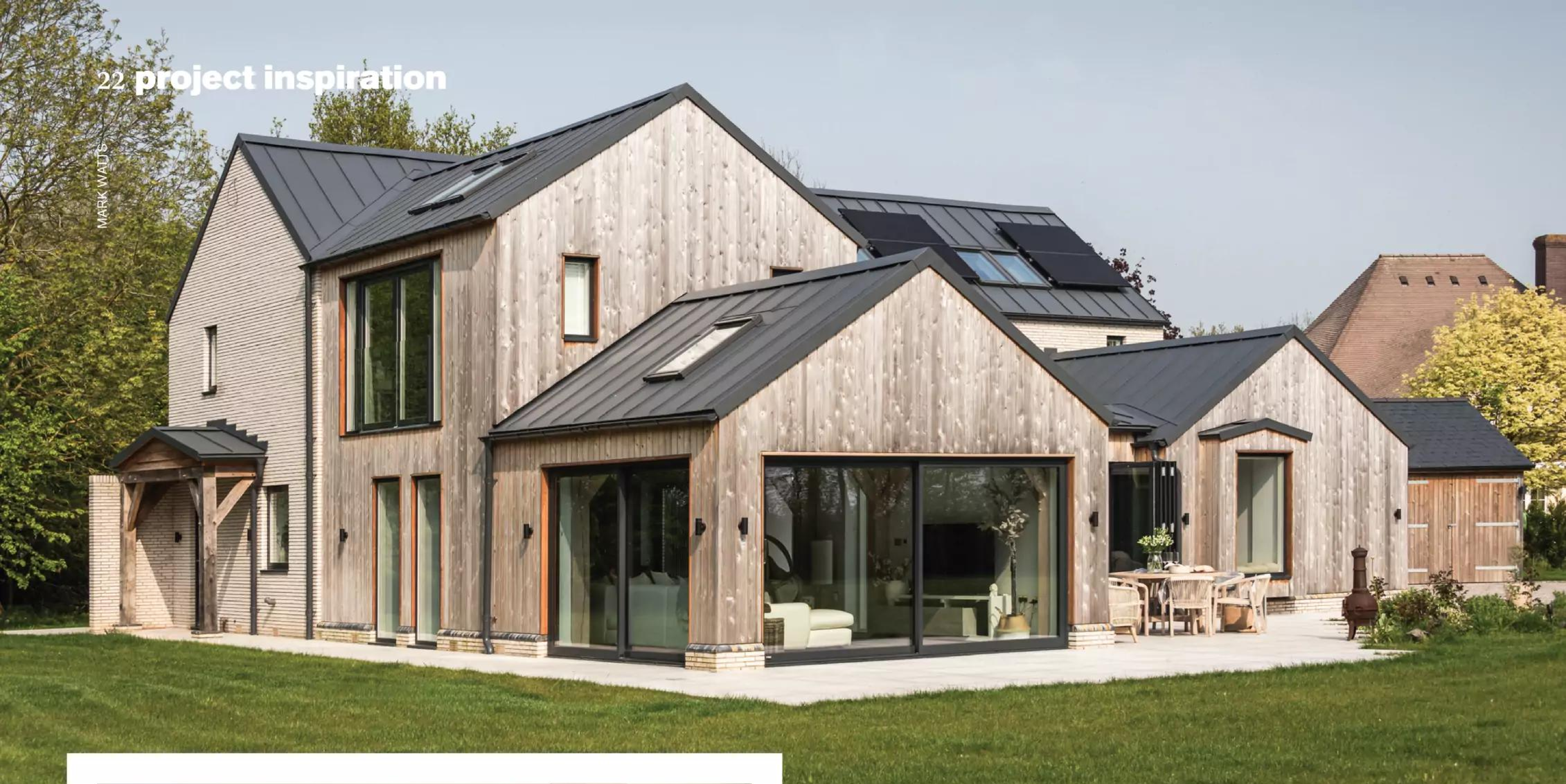
LIGHT-FILLED LIVING

Tonks House by Welsh Oak Frame is a contemporary oak frame home designed to complement the sweeping Montgomeryshire countryside views. The 165m² build features post-and-beam structures that define open-plan living spaces and a spectacular double-height stairwell, creating a sense of volume and light. The oak frame was assembled on site over just 20 days. The infill panels were carefully insulated to achieve exceptional thermal performance and airtightness. Clad in natural oak with slate tiles and a surrounding brick plinth, the home blends seamlessly into its glorious, rural surroundings. **(www.welshoakframe.com)**

ON THE FLIP SIDE

This contemporary residence by Green Oak Carpentry showcases an innovative and future-proof upside-down layout, positioning the open-plan kitchen, dining and lounge areas on the first floor to capture light and views, while bedrooms and bathrooms occupy the ground floor for privacy and comfort. The exposed oak frame, featuring elegant sling-braced trusses, defines the property's architectural character. Inside, the frames have a sand-blasted finish to create a soft, pale tone that enhances the material's warmth, creating a truly cosy family home. **(www.greenoakcarpentry.co.uk)**

DREW SHEARWOOD



MARK WATTS

SCANDI STYLE

This contemporary, Scandi-inspired oak home in the Suffolk countryside unites craftsmanship with modern design. Built using a bespoke oak frame and prefabricated panel system from Oakwrights, it achieves exceptional efficiency and comfort. Expansive glazing, level thresholds and a central courtyard create a seamless connection to the outdoors, while the lime-waxed oak frame and floating staircase fill the interior with sunlight. Externally, white linear brick, vertical British cedar cladding and a sleek GreenCoat metal roof enhance the house's Nordic feel With WrightWall insulated panels, solar power and an air source heat pump, this sustainable family home blends contemporary elegance with lasting performance. **(www.oakwrights.co.uk)**

EXPERT VIEW DESIGN CONSIDERATIONS

LUKE SUTTON, design associate at Roderick James Architects, explores how to make the most out of your oak frame home

Q Can you create a contemporary style home using oak frame?

Don't assume that an oak build means you're constrained to the symmetrical pitched-roof house type – oak framing lends itself just as readily to dynamic, modern architecture. Dramatic internal spaces can be achieved by cantilevering beams and rafters, for instance. Stainless steel tie-rods and bolted connections offer a modern alternative to traditional curved oak corner braces and pegged joints.

Q What materials and finishes best complement oak?

Oak combines beautifully with a considered palette of similarly natural, low-carbon materials. Externally, this might include timber cladding and natural stonework. Light, textured internal surfaces such as painted timber, clay-based plasters and eco paints carry on that theme.

In more contemporary houses, combining an oak frame with modern finishes, such as stainless steel and polished concrete, can give a more engineered aesthetic. These hard surfaces need to be tempered with soft furnishings and warm lighting, so it feels homely.

Q Does oak permit modern architectural features?

By its nature, oak framing is comprised of posts and beams – linear members organised to form a structural grid. Curved features are definitely possible, but they tend to be formed of faceted frames, rather than a fluid curve with no straight edges. However, curved internal partitions can be used to sub-divide a space, independent of the oak frame's structural grid design.

An oak frame is crafted and assembled while the timber is in its green workable state. Once enclosed, the wood gradually dries and hardens, resulting in shrinking and some movement in the oak. Designers need to take this natural process into account – for example, when they are detailing modern bifold and sliding door systems that have a fine degree of tolerance. Solutions might involve isolating the joinery from the oak frame and giving careful thought to its positioning relative to the internal oak structure.

Q How can an oak frame home complement the landscape?

Your need to spend some time at the outset of your project working out how your build can respond to its specific site. The sun's path might inform the relationship between the kitchen, living and dining spaces to the garden. Using the building to shield these spaces from prevailing winds and avoid overlooking your neighbours maximises their use and enjoyment.

A steeply sloping site with far-reaching vistas can lend itself to an upside-down house, where the bedrooms are arranged on the ground floor and the living spaces are situated above. This creates opportunities for balconies and a relationship with the garden at both equal.

On level sites, there is greater scope for the house to ramble into the surrounding environement, with smaller oak frame wings extending from the main body of the house. This creates interior spaces with different aspects and light qualities, where vaulted ceilings and glazed gables are all possible.

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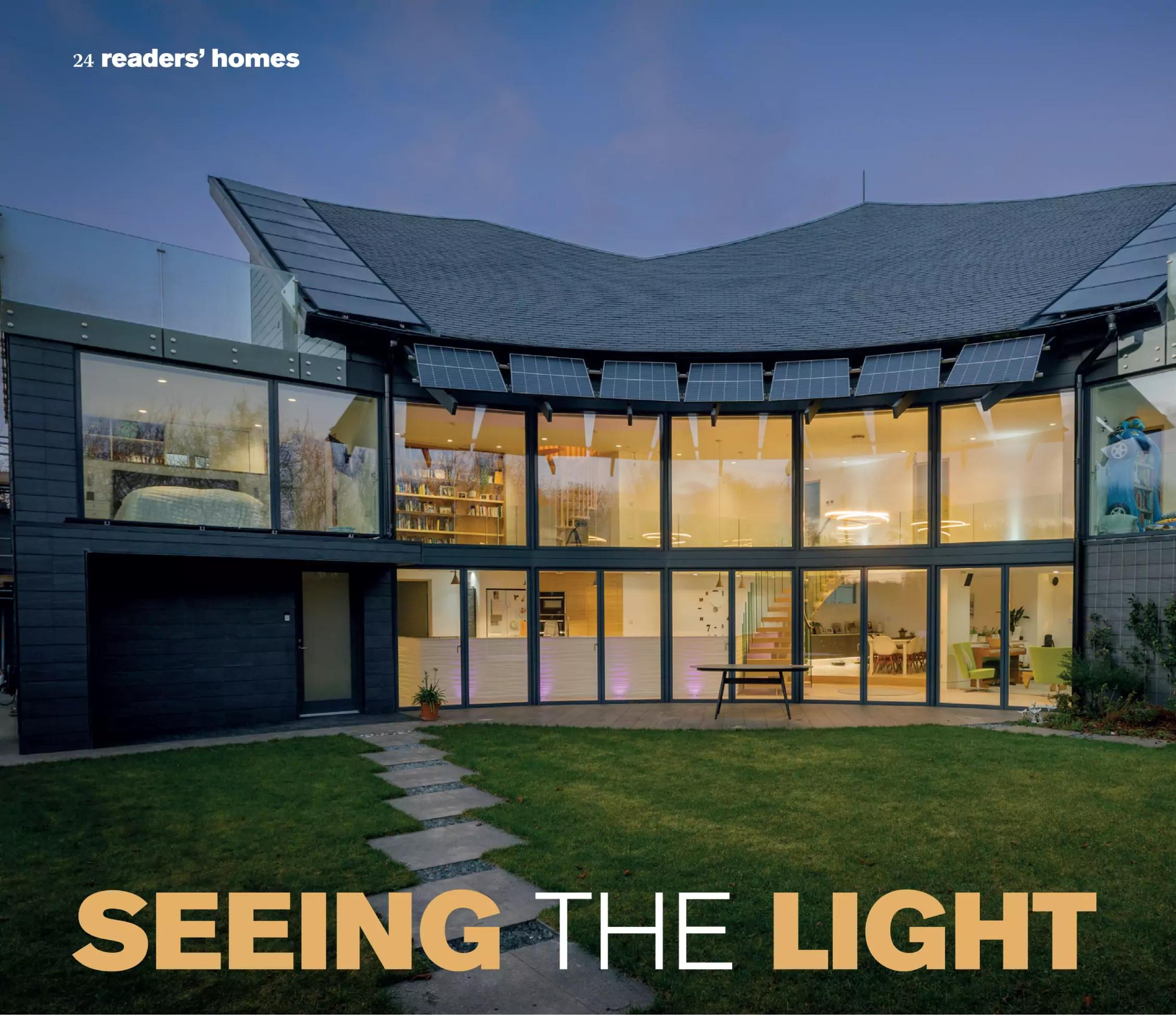


SEEING THE LIGHT

Nathan and Kelly Davis designed and self built their sustainable curved home in response to both the tight site and Kelly's loss of vision, making light a top priority

Curve House is a shining example of how a self built home can respond not just to site constraints, but also to deeply personal needs. Designed during a major life transition – the arrival of a young family and a period of significant vision loss for one of the owners – the property incorporates light, openness and adaptability.

Transforming an awkward site

When Nathan Davis first stood on the overgrown Cornish plot that would become his family's home, he imagined something extraordinary: a building that would not impose on its surroundings but instead embrace them. Fourteen years after buying the land, Nathan, wife Kelly and their children now live in a house that combines sculptural form with environmental responsibility – a home as distinctive as it is thoughtful. "We didn't set out to make a statement piece, but wanted something that was true to the landscape," explains Nathan, co-founder of sustainable architecture practice ARCO2. "The site demanded a building that curved and flowed with it, not something boxy or abrupt."

The 0.235-acre plot was fairly unremarkable at first glance: an awkwardly shaped site bounded by mature hedgerows. "It offered an ideal location with no strong design precedent to follow, giving creative freedom rarely found in such settings," says Nathan. "The land already had planning permission in place, which made our new application relatively straightforward."

Kelly's eyesight challenges also played a defining role in shaping the layout and glazing strategy for the home. As a type 1 diabetic, the condition began to affect her ability to adjust to changing light levels. This informed the inclusion of extensive glazing, which has been designed to flood the house with consistent natural light and ease transitions between inside and out. Orientation played a central role. The sweeping plan fans east to west, optimising solar gain through

WORDS **DEBBIE JEFFERY**
PHOTOS **CHRIS HEWITT**

Left: The curved design of the house addresses site constraints and captures sunlight throughout the day, which improves both comfort and energy generation

Below: Solar panels have been carefully integrated across the property, on the standing seam zinc roof, the flat-roofed porch and the brise-soleil that shades the large area of south-facing glazing

expanses of triple-glazed windows, while the main living spaces track the arc of the sun, enjoying bright, open vistas.

Playing the long game

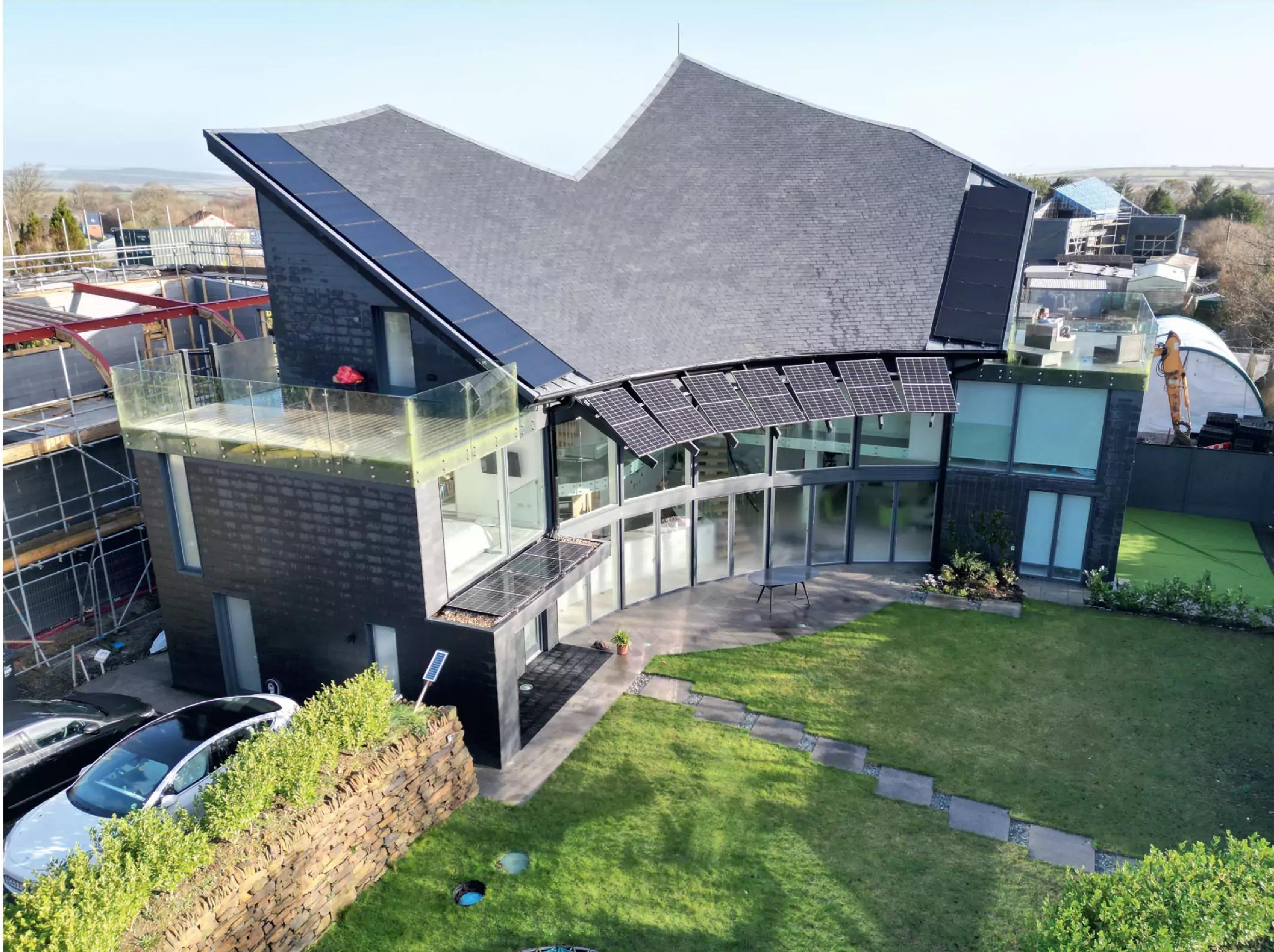
From the outset, Nathan and Kelly knew they would have to build slowly, funding the project as they went. "We were both working, raising our children and managing other responsibilities, so we accepted that this would be a marathon, not a sprint," says Kelly.

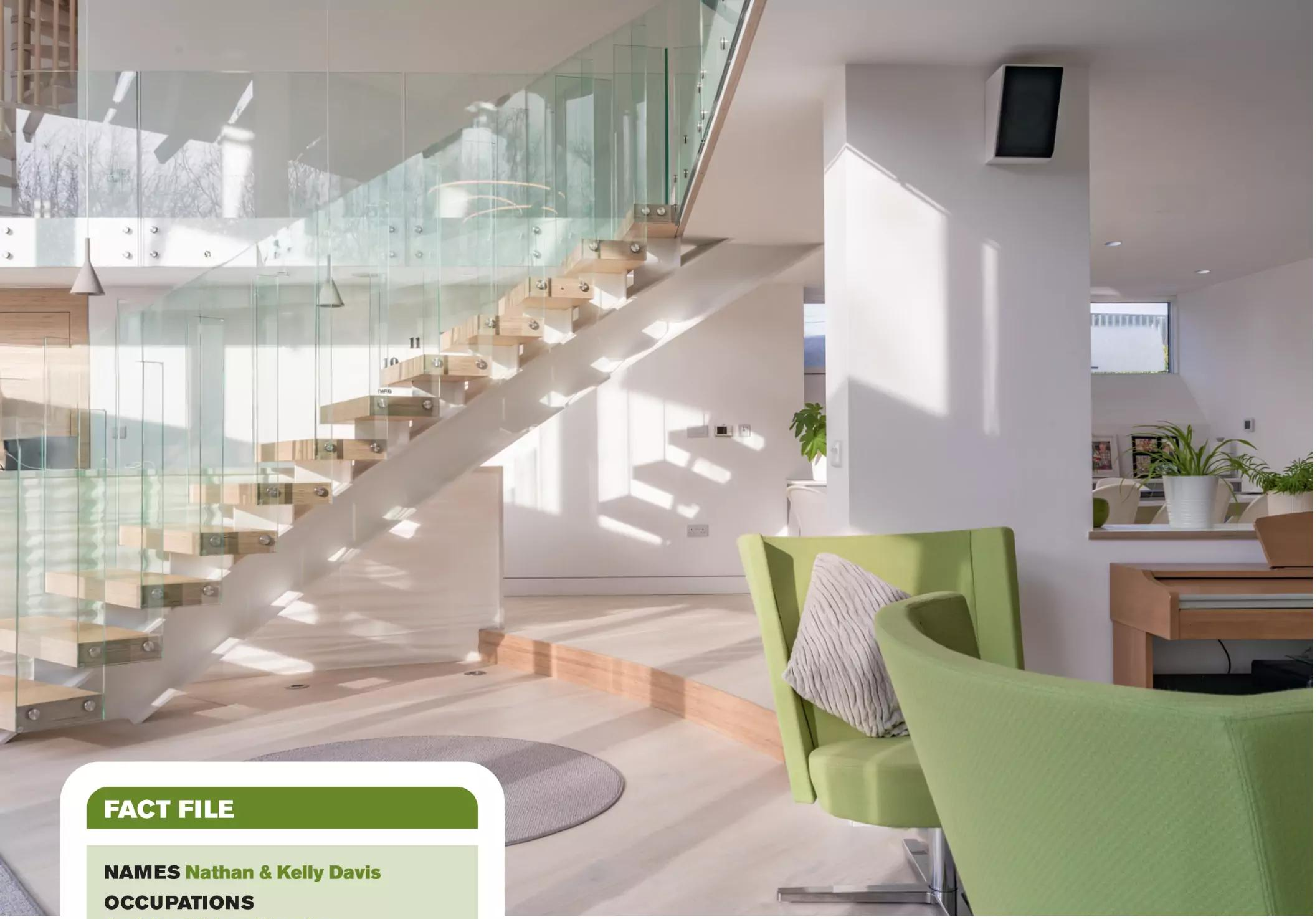
Construction began in 2014, with Nathan first prioritising groundworks and building the workshop that would serve as a base for on-site fabrication. He bought an excavator, which his father taught him to operate, and together they carried out the excavation and drainage. "I also called on a number of friends to help install the shuttering, reinforcement steel and to assist with the concrete pour," says Nathan. "Although the footprint of the house was complex in shape, that stage of the build was surprisingly smooth and efficient."

Reinforced edge-thickened foundations and curved blockwork walls form the base of the house, providing thermal mass. Above this is a softwood timber frame, which follows the sinuous form, with glulam beams employed where greater strength was required to span wide openings or achieve tight radii.

Building a curved house is no small feat, especially when managing the construction yourself. A site-built timber frame, with its inherent flexibility, lent itself to the form, but still required precision. Nathan used 3D modelling software to work out the geometry and created full-scale templates for critical sections. "There's nowhere to hide with curves. Everything needed to be precise to achieve the shapes, and getting the roof right was the most challenging part," he says.

Hard-wearing, low-maintenance materials were chosen, and the natural slate curved roof was painstakingly designed using a mix of





Above: The feature staircase is built around a large curved central steel beam, with numerous adjustable level plates, CNC-cut birch ply treads and laminated glass balustrades

FACT FILE

NAMES Nathan & Kelly Davis

OCCUPATIONS Architect & head teacher

LOCATION Cornwall

TYPE OF PROJECT Self build

CONSTRUCTION METHOD Timber frame & blockwork

PLOT SIZE 0.235 acres

HOUSE SIZE 314m²

LAND COST £75,000

BOUGHT 2010

PROJECT COST £456,194

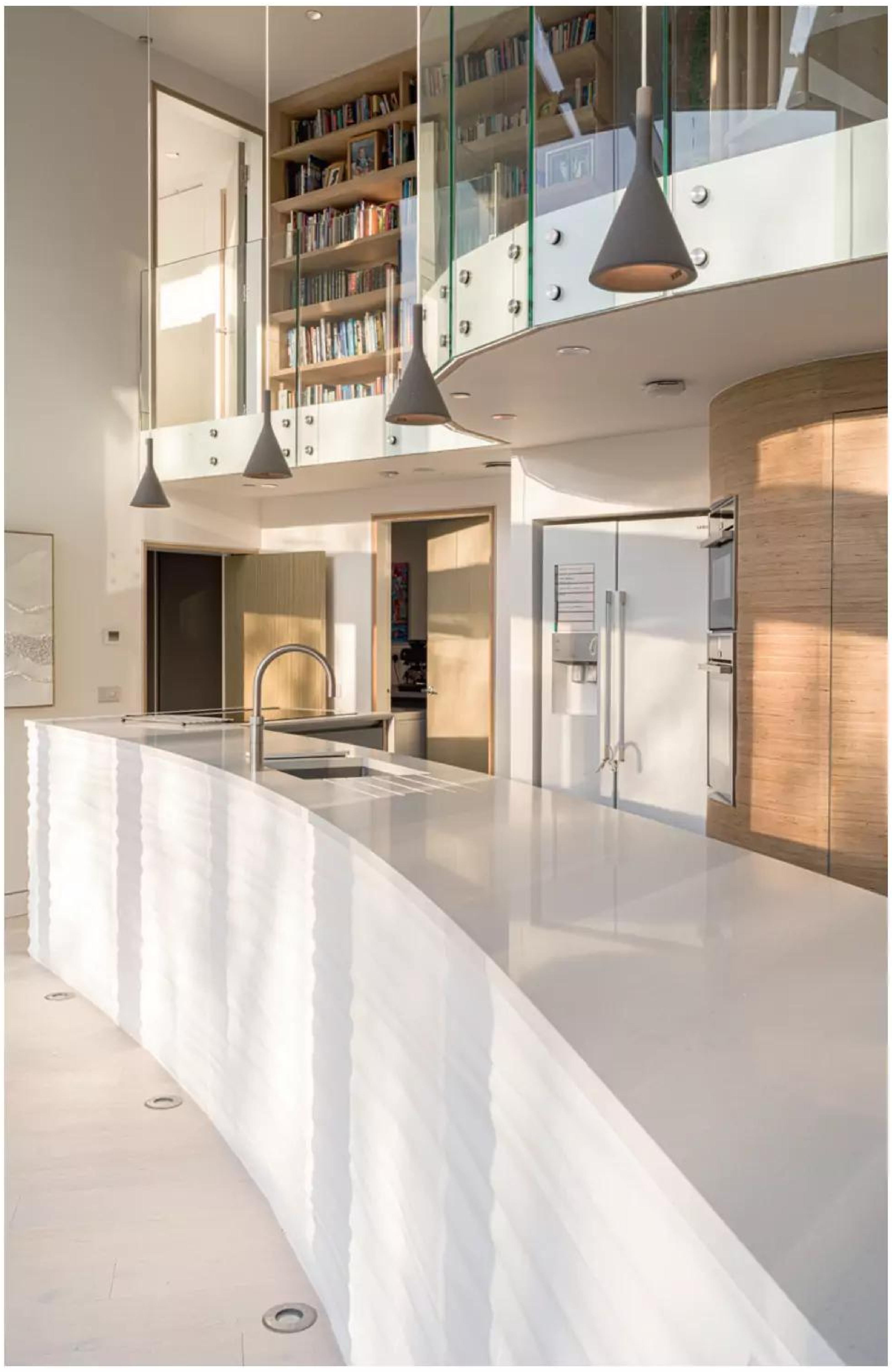
TOTAL COST £531,194

VAT RECLAIM £49,283

BUILDING WORK COMMENCED 2014

BUILDING WORK TOOK 8 years

CURRENT VALUE £920,000

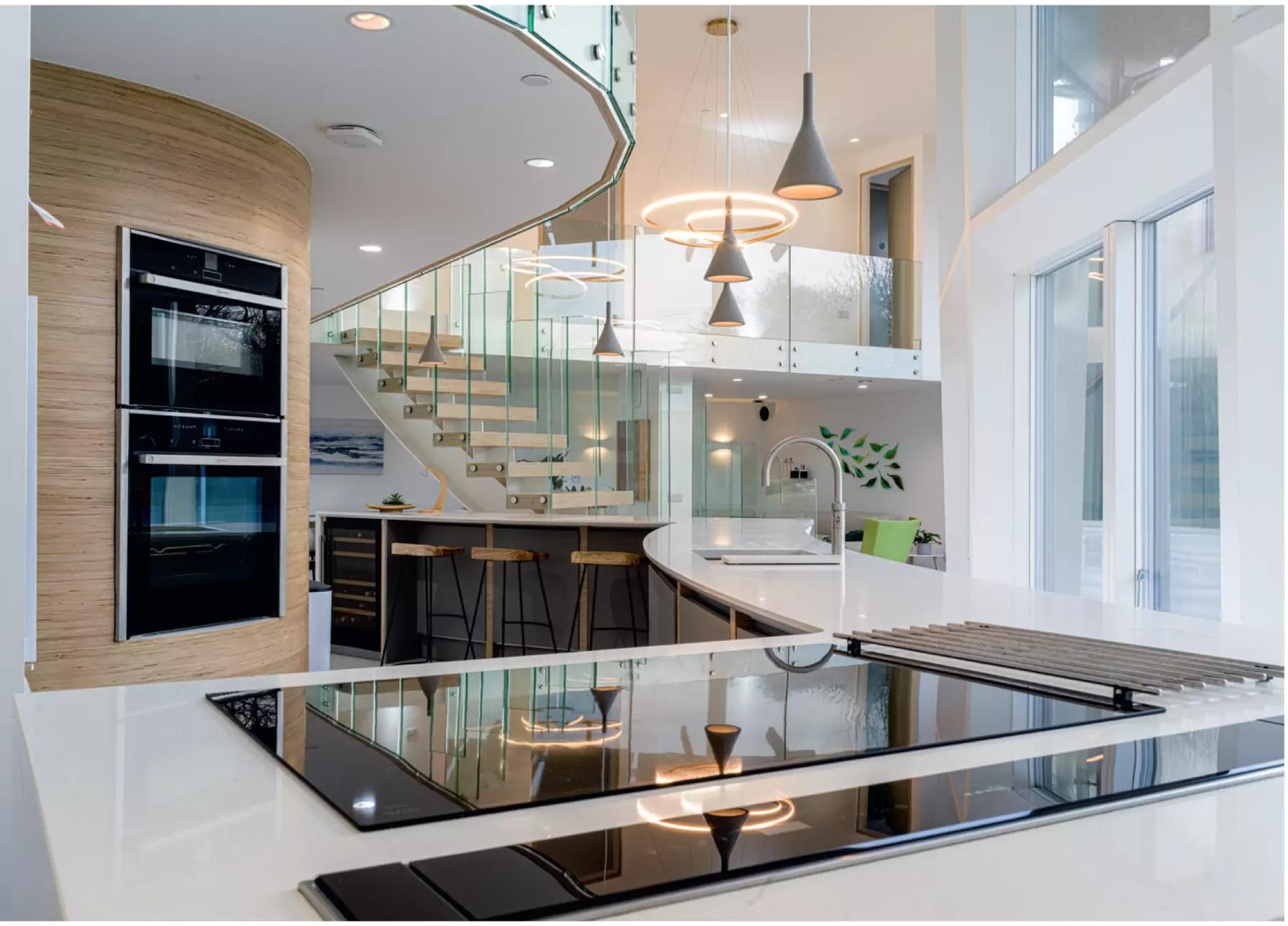


slate sizes and carefully calculated laps to efficiently manage water run-off. A zinc standing seam roof also houses the solar panels.

Following family footsteps

"Building and creating have always been part of who I am," says Nathan. "My parents did four self builds, so I grew up surrounded by this and I was immersed in the tools, timber and mindset that come with making things happen from the ground up. I love learning new techniques, experimenting with materials and pushing boundaries."

Nathan's father, Keith, was by his side throughout the build, generously giving up his weekends and offering support at every stage along with Nathan's mum, Jackie. The eight-year construction period was marked by bursts of intense activity, interspersed with longer periods of planning, problem-solving and patiently saving for the next phase. "We began the project with savings, a self build mortgage and a loan from my parents, aiming to stay within a



Left: The curved form of the house dictated the shape of the kitchen, while clever use of stacked birch plywood enabled standard units to be faceted around the curve

£300,000 budget, but as the design evolved and challenges arose, costs increased and we ran out of money," says Nathan. "Unable to extend our self build mortgage, or raise further funds ourselves, my parents stepped in and remortgaged their own home to help us."

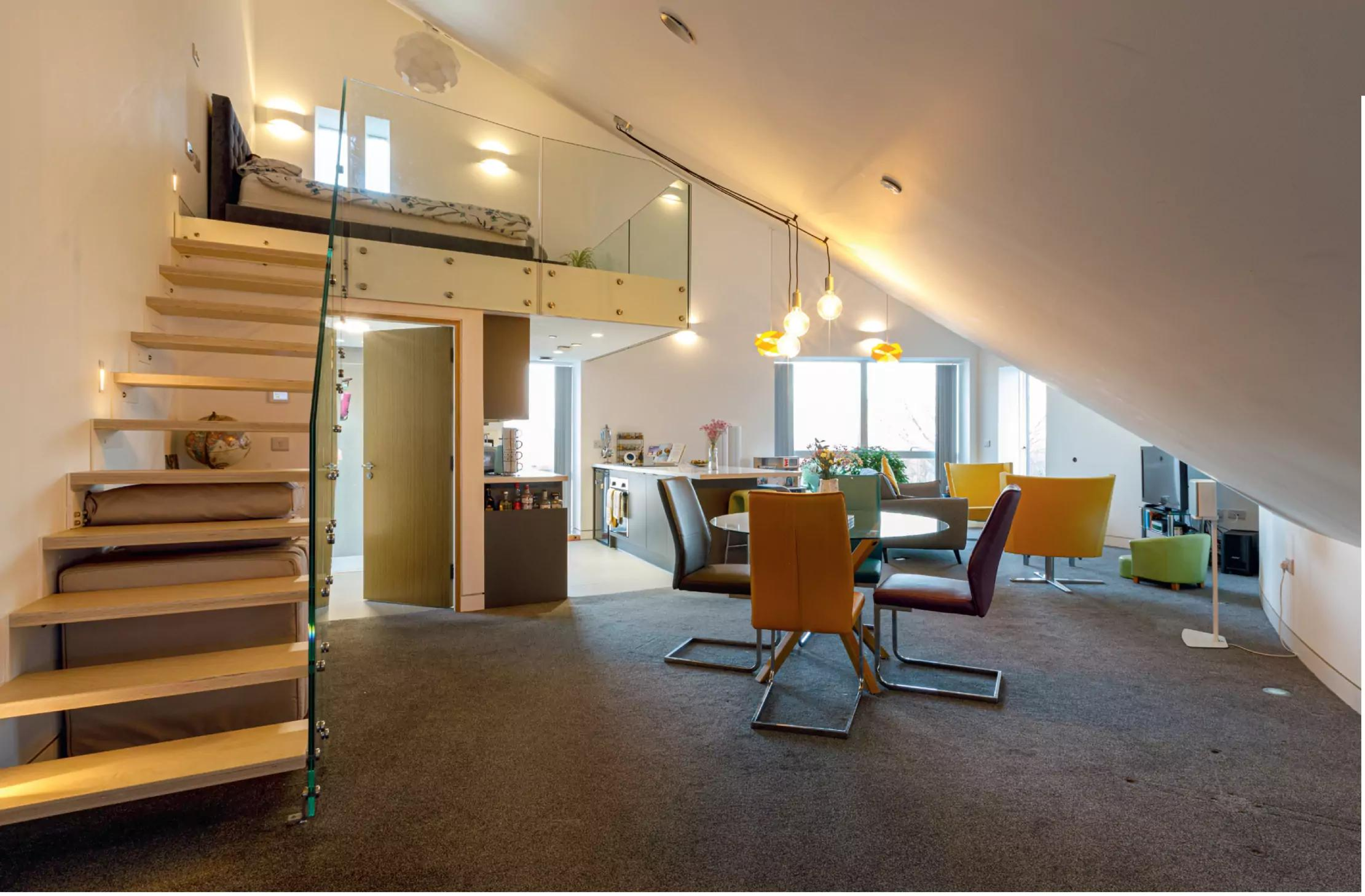
As the build progressed and became more complex, the family made the decision to move into a caravan on site. Nathan reduced his hours to a four-day working week, which gave him three full days on site, plus early mornings and late evenings. "I managed the project using a detailed programme, and one golden rule: always stay at least a month ahead of the build process. For any items with longer lead times, I made sure they were programmed well in advance to avoid delays," he says. "Kelly and I developed our own ritual, something we affectionately called Wednesday Night Club. It wasn't as glamorous as a date night, but it became a key part of our routine. Each week, we'd sit down to review progress, make decisions and agree on the next steps. What could have been stressful became something we truly enjoyed."

Flowing zones

Inside, the house is arranged to suit both sociable family life and moments of retreat. The ground floor is largely open plan but subtly zoned, with changes in floor finish and ceiling height distinguishing the kitchen, dining and sitting areas without losing the sense of flow.

"We didn't want any barriers between spaces, but we did want a sense of progression through the house," says Kelly. "The layout works brilliantly when we entertain. Everyone gravitates to the big curve of the dining area with the view beyond."

A glazed link area in front of the core living space connects to a utility room, shower room and guest suite, in the west wing. To the east, a flexible living area currently serves as playroom and gym but has been fully wired and plumbed to create an accessible bedroom in future. Nathan's architect's eye shows in every detail, from the generous roof overhangs that shade windows in summer, to the



deep reveals that frame views. "It's all about controlling light, heat and perspective," he says.

Above: The second storey features a mezzanine level above, which hosts an extra bedroom. The open design throughout creates a sense of spaciousness and maintains visual connection across different parts of the home, promoting unity

Internally, the materials reflect the same ethos of sustainability and simplicity. Engineered oak flooring, laid over a thick screed and separated by insulation, provide thermal mass, while an air source heat pump connects to underfloor heating. Storage is cleverly integrated throughout, with built-in units that follow the curves of the plan. The staircase (made by Nathan from a concept by Kelly) forms a sculptural centrepiece in the hall, with treads cantilevered elegantly from a curved wall. "We didn't want anything that felt fussy or contrived," says Kelly. "Just simple, honest materials that let the form and the light do the work."

One of the most challenging tasks was installing the external fibre cement sheeting. Typically used on agricultural buildings, this material was chosen for its cost-effectiveness, robust warranty, and rural aesthetic, especially once finished in black to blend with the surrounding landscape. However, each board weighs around 50kg and is large and cumbersome, making installation physically demanding and logistically complex. To make this feasible, Nathan relied on carefully erected scaffolding throughout every stage of the build. The structure had to be frequently adapted and adjusted to ensure safe and accessible working platforms at all heights. "In hindsight, scaffolding was something I had under-budgeted for, both in cost and complexity, but it proved absolutely essential for the safe execution of a project of this scale," he says.

Low impact home

From the beginning, environmental performance was as important as aesthetics. The house has been super-insulated using sheep wool and recycled newspaper insulation, with airtight detailing to minimise

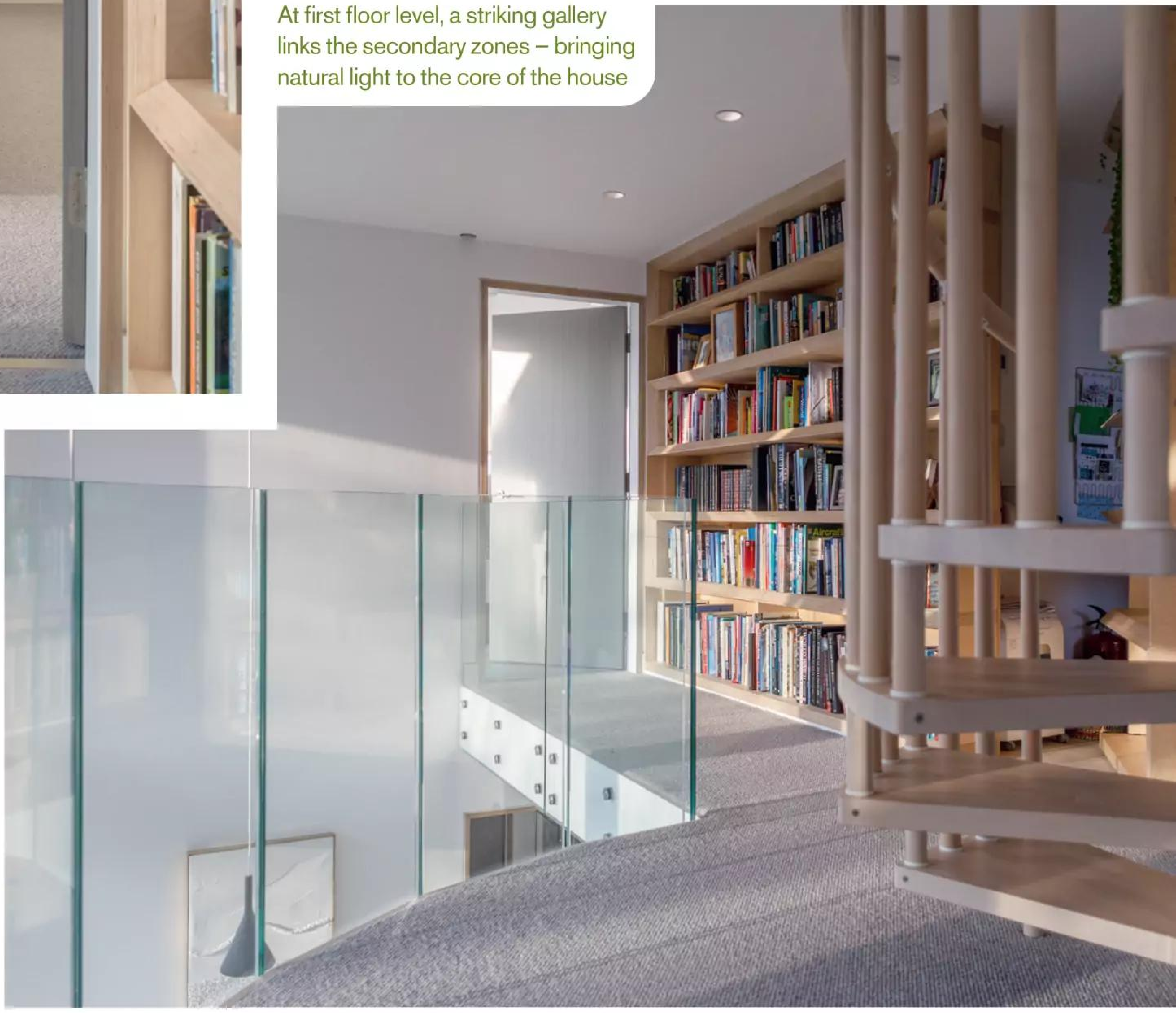
WE LEARNED...

WHEN LOOKING FOR A PLOT, consider splitting a piece of land. This site was too expensive for us, but we divided it in two and paired up with a friend, who bought the other half.

HAVE TWO WHITEBOARDS on site to keep a detailed track of everything. Breaking the project down into smaller, achievable targets helped me stay focused and motivated.

OVERSIZING THE SOAKAWAY and using recycled materials within it got some negative reactions, but I'd done the research and understood how climate change was shifting rainfall patterns, so I wanted to get the fundamentals right to future-proof the site.

OWNING A DIGGER, dumper and telehandler for the duration of the build was useful. These allowed for efficient site work, including excavation, material handling and positioning structural components.



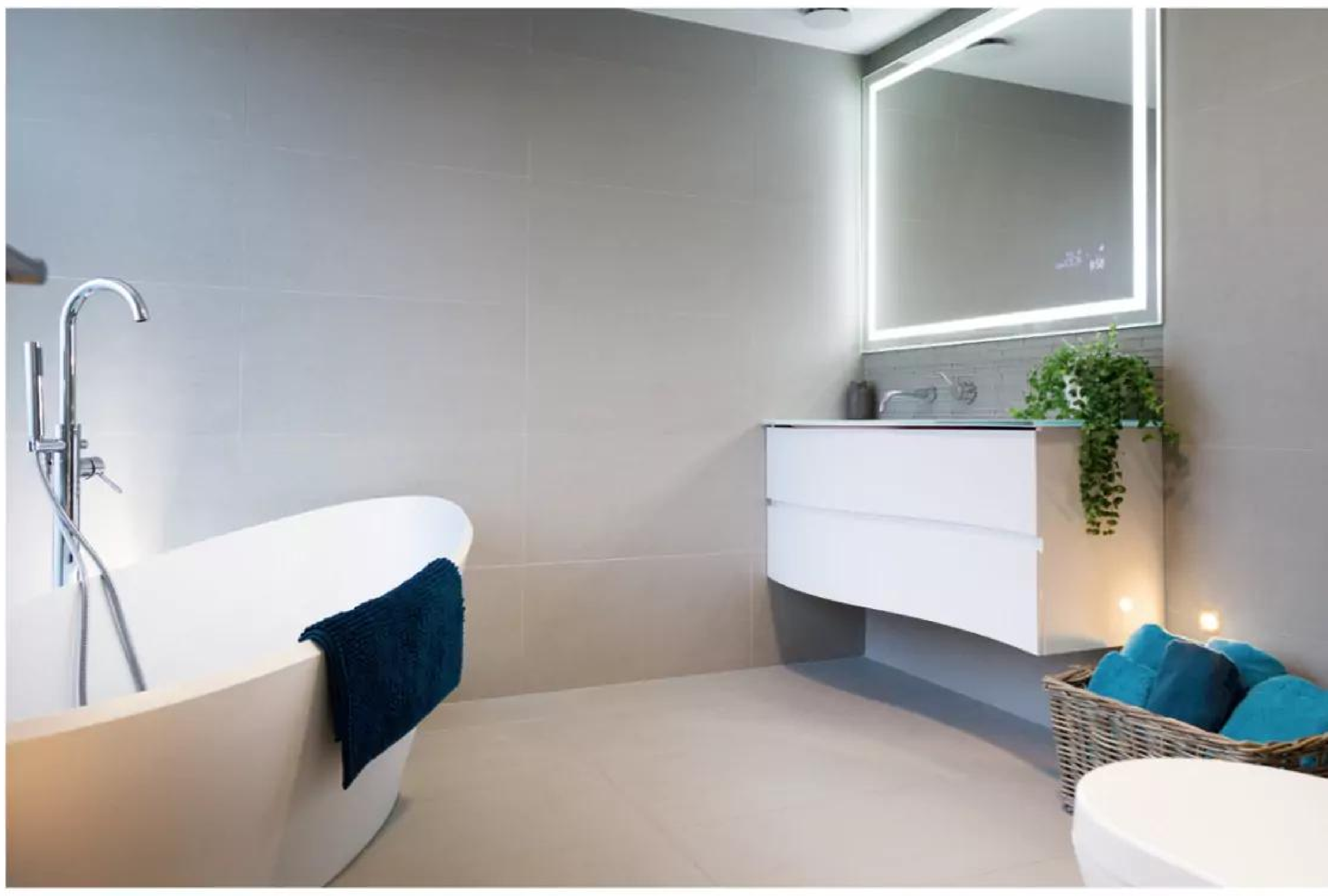
At first floor level, a striking gallery links the secondary zones – bringing natural light to the core of the house

heat loss. Aluminium-clad triple-glazed timber windows, the air source heat pump, solar PV panels and rainwater harvesting system all contribute to low running costs. "We wanted a house that didn't just look green but truly performed and would be future-proof: not only in terms of energy efficiency and adaptability, but also with the potential to generate income when the time comes to retire," says Nathan. "Our heating bills are minimal as the passive solar design does so much of the work."

The sedum roof established on the storage container/workshop not only enhances biodiversity but also reduces rainwater run-off and helps to moderate internal temperatures for the equipment and gym space. Groundworks, foul drainage, and the foundation slab took nearly two years to complete, and during that time Nathan also restored a neighbouring piece of land he had acquired, using retained spoil to build a wildlife bund. This prevented around three thousand tonnes of materials from going to landfill, and the bund now acts as a wildflower corridor, providing biodiversity and a natural buffer to a neighbouring storage yard.

Building over eight years was not without its strains. "It became part of life," Nathan reflects. "Our children grew up alongside the house. They learnt practical skills and saw problems solved. It was stressful at times, especially when we were building during the pandemic, but it was also hugely rewarding. There were tough moments, of course, but the sense of achievement at the end is incredible. Every part of the house has a memory attached."

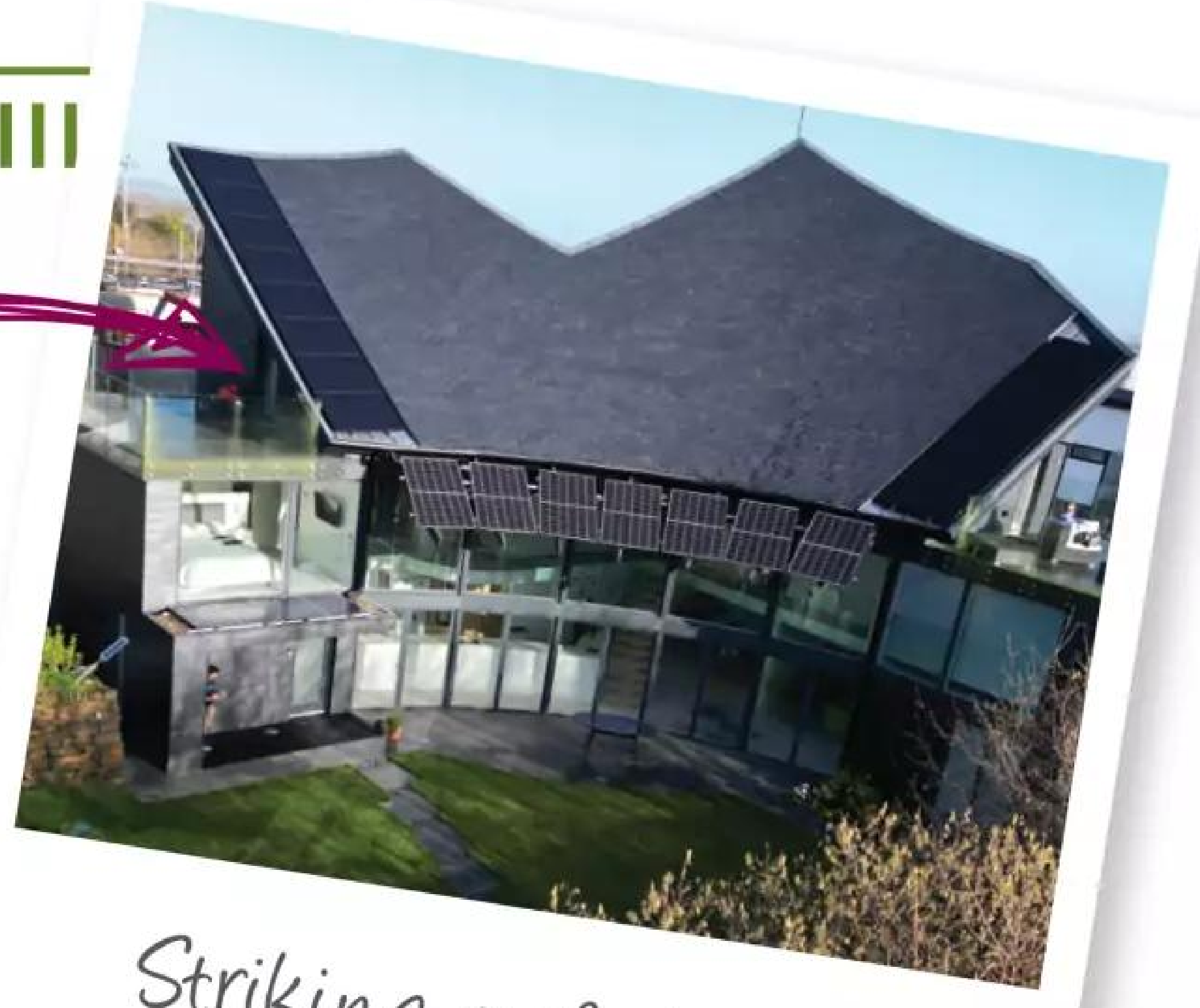
Right: All tiled areas in the house feature the same finishes, which allowed offcuts to be used to keep cost and waste to a minimum



closer look

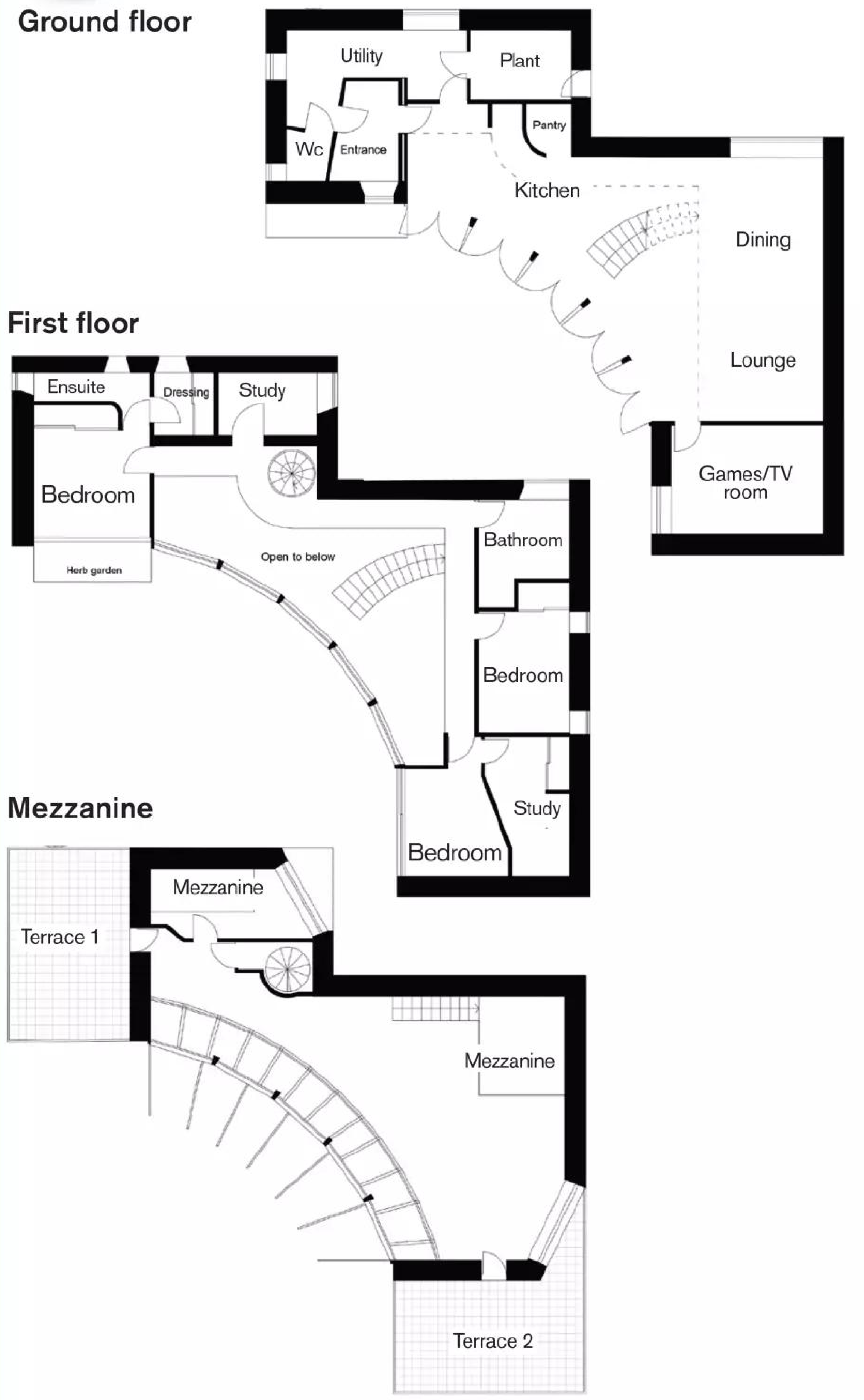
The curved roof...

One of the home's defining features is its sweeping curved roof, shaped by a restricted boundary line. Beyond its sculptural appeal, the curve enhances solar performance – its flanks are fitted with photovoltaic panels that generate power and act as a brise soleil to reduce glare and heat. "The only time I brought in a specialist was at the roofing stage, to ensure it was done correctly," says Nathan. "I worked with a master craftsman, whose skillset brought the roof to life."



Striking roof design

Floor plans



TOTAL BUILD COST BREAKDOWN

Elements	Cost m²	Cost %	Total cost
Preliminaries (caravan & services, scaffolding hire)	£41	3%	£12,810
Foundations & excavations, underground drainage	£111	8%	£34,826
External walls & windows	£424	29%	£133,148
Roof structure & covering	£165	11%	£51,897
Internal walls	£48	3%	£14,966
Floor, wall & ceiling finishes	£102	7%	£31,956
Joinery & fittings (incl. stairs)	£94	7%	£29,656
Plumbing & heating, bathroom & kitchen	£180	12%	£56,591
Electrics	£90	6%	£28,298
Decorating	£70	5%	£21,829
Excavator, dumper & telehandler	£26	2%	£8,120
Application fees	£4	>1%	£1,380
External works	£98	7%	£30,717
Grand total			**£456,194**

Note: The costs shown here reflect the original prices for materials, labour and services at the time this project was undertaken. As a general guide, inflation in the construction market runs at about 3%-4% per annum.

Useful contacts

ARCHITECT, QUANTITY SURVEYOR, PROJECT MANAGER, LANDSCAPE DESIGN **ARCO2** 01208 72100 www.arco2.co.uk INSURANCE **Self-Build Zone** selfbuildzone.com STONE MASONRY **J Grigg Cornish Stonework** 07470 992899 STRUCTURAL FRAME **Tamar Trading** www.tamartrading.com ROOFING **Sean Sullivan** 07970 596 798 JOINERY & BUILDING **Sam Gough & Neil Harrison** 07718 215 752 WINDOWS **Velfac** 01480 759 510 www.velfac.co.uk PLASTERBOARDING **Tony Mugford (Plaster boarding & dry lining)** 07730 510 619 PAINTING & DECORATING **Foti** 07812 898 938 SOLAR & BATTERY INSTALLATION **Joe Newnes (SWE)** 07376 058 182 GUTTERING **Lindab** 01604 788350 www.lindab.com ELECTRICIANS **Lloyd Electrical** 07792 678 808 DOORS **Doors of Distinction** www.doorsofdistinction.co.uk HEATING **Vaillant** www.vaillant.co.uk KITCHEN **Wren Kitchens** www.wrenkitchens.com BATHROOM FITTINGS **Victorian Plumbing** www.victorianplumbing.co.uk PLUMBING **BE Heating & Plumbing** 01208 820001 www.beheat.co.uk STAIRS **MGC Engineering** 01208 812585 www.mgcengineering.co.uk FLOORING **DWF (Direct Wood Flooring)** 03308 182555 www.directwoodflooring.co.uk **Bodmin Flooring Company** 01208 76859 www.bodminflooring.co.uk

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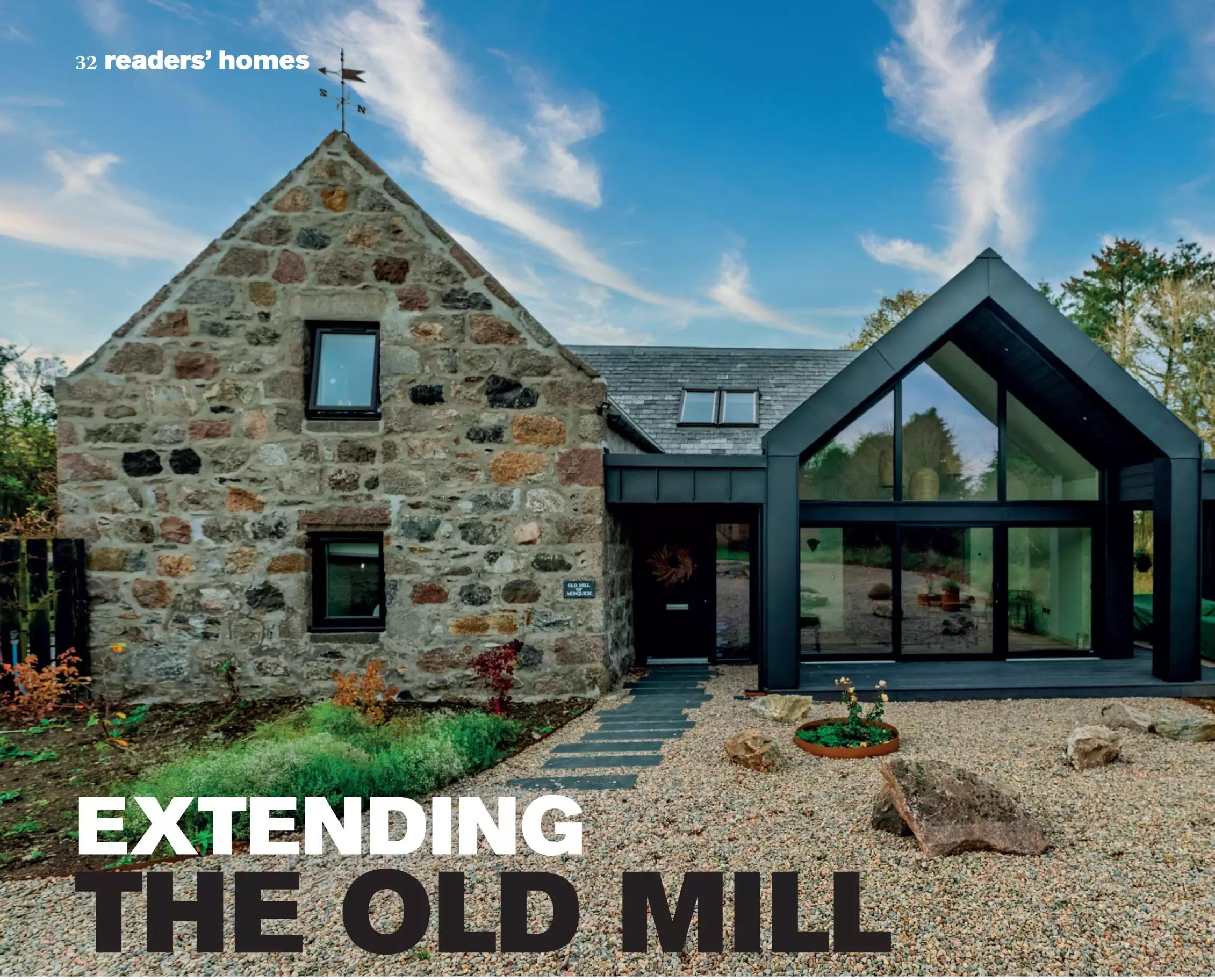
Discover more about David and Mhairi's *self-build story*



EXTENDING THE OLD MILL

When a storm left their home flooded, **Susan and Rob Caslake** took the opportunity to turn a negative into a positive by taking on a major home improvement project

WORDS **CAROLINE EDNIE** PHOTOS **DAVID GORDON**

Susan and Rob Caslake had always intended to make improvements to the family home in rural Aberdeenshire where they have lived since 2014. However, flooding damage caused by a storm in the summer of 2020 forced their hand. The couple turned this event around, as it led them to take on a more ambitious project. In doing so, they have managed to create their ideal long-term family home.

Catalyst for change

The Caslake's home is a former water mill that had been converted into a house in the 1990s. "When we bought it 11 years ago, it had planning permission for an extension, which we put in the back of our minds as something we might do in the future," says Susan. "When we moved in, we had a two-year-old and another on the way, so we weren't keen to get into a building project straight away."

They were holding out for the right time both in terms of their finances and family life. But, when a big storm hit in August 2020, sudden rain on the quite low-lying house brought surface water inside the ground floor of the property. "It was horrendous – the drainage wasn't up to the standard it should have been," says Susan. "We were lucky that the ground floor is on two different levels. The kitchen-diner and the study on the upper level were fine, but our sitting room, bathroom, entrance and hallway were all flooded."

Everything had to be dried out and stripped back to the subfloor. "All of this was in the middle of Covid, too, when Bob and I (we are both hospital doctors) had to keep working," says Susan. "It was also during Pandemic restrictions." The damage and upheaval was difficult, but also precipitated the couple's decision to look at improving the whole house once and for all. "We had some insurance money from the flooding," says Susan. "But we thought that we should look at the bigger picture to renovate and extend to try and make a positive thing out of a negative."

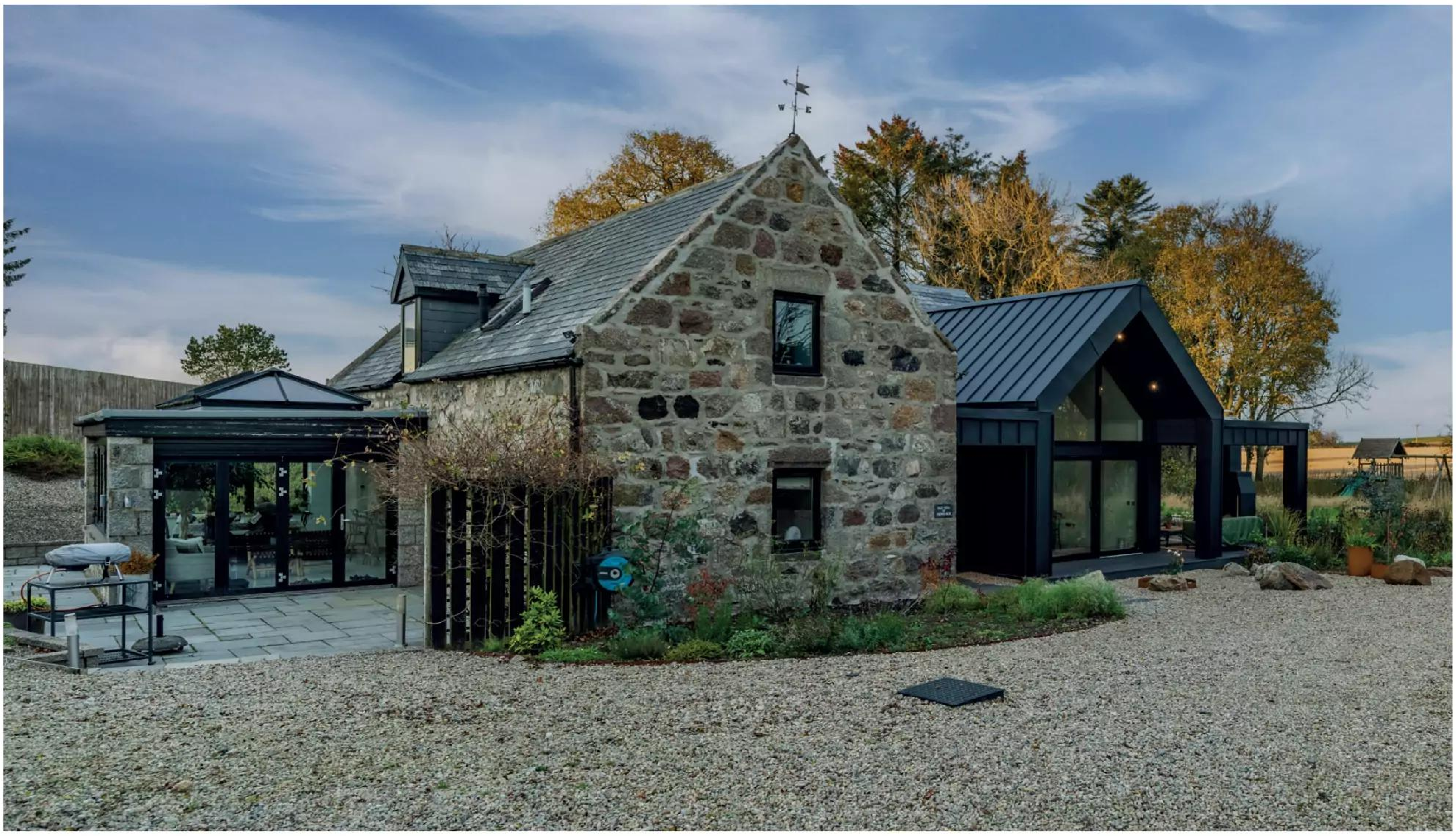
The vision

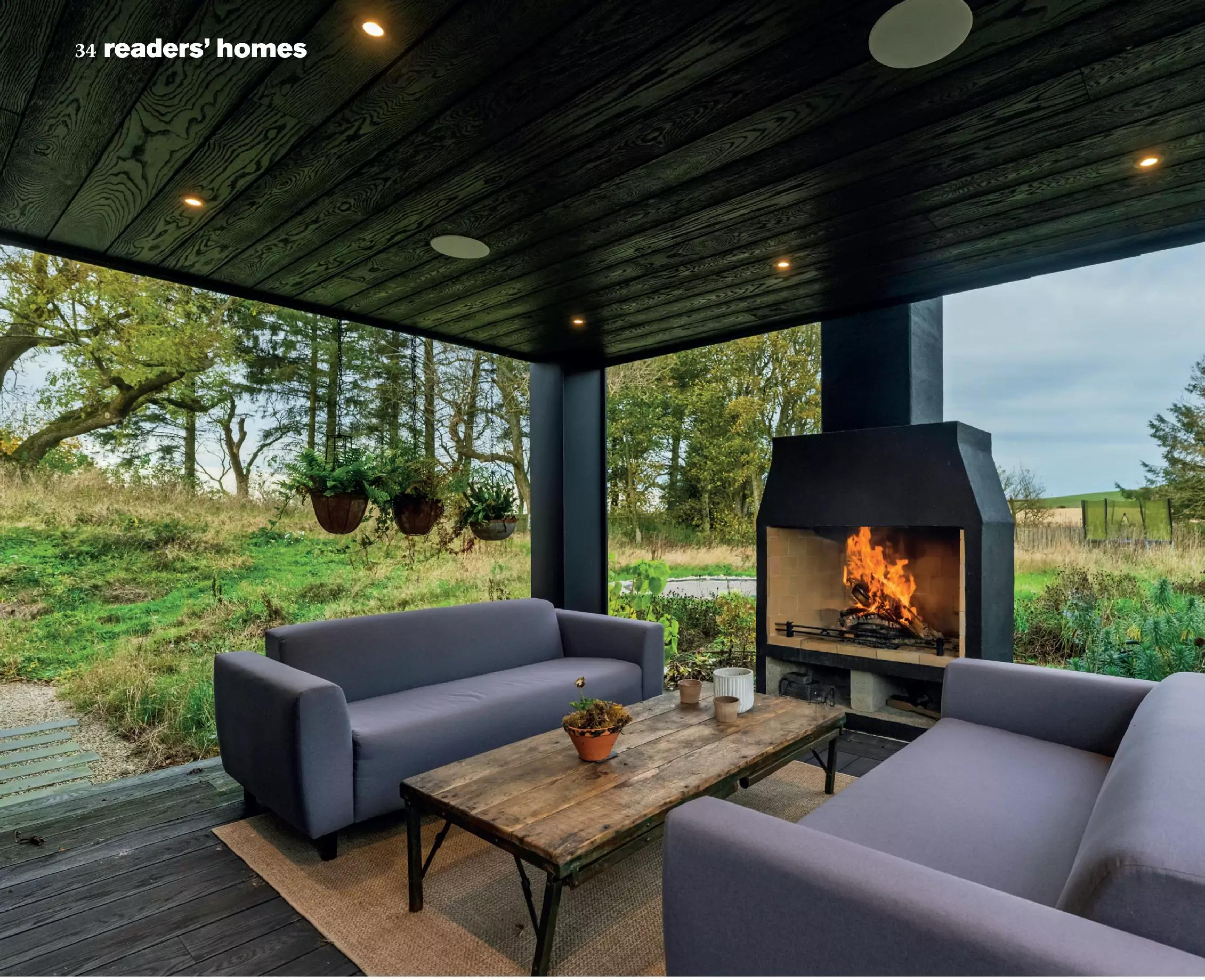
The main focus of their project was the 1990s concrete extension that housed the property's entrance, hall, sitting room and bathroom.

Left: The fabric of the existing extension, onto which the new dining area addition has been built, was upgraded

Below: The property was once a water mill, dating back to around the turn of late 19th/ early 20th century. It was converted into a house in the 1990s

The family felt this part let the building down aesthetically and wasn't being used as well as it could be. "The lower ground level of the house flooded in two different ways," says Susan. "It had come through the subfloor space, so we wanted to get rid of this and install a concrete slab that would prevent water ingress. We also had three old sets of French doors that let the surface water in, so we wanted to look at replacing this arrangement. In terms of our brief, although we had a big kitchen-diner, we really like entertaining, so thought it would be good to have a large separate, more formal, dining area. We also wanted to extend the entrance hallway to make it more practical with more storage space for shoes





Above: The deck is a composite material that was chosen for its low maintenance properties as well as aesthetically combining well with the black stained timber soffit to create an enclosed feeling and sense of cosiness to the outside seating area

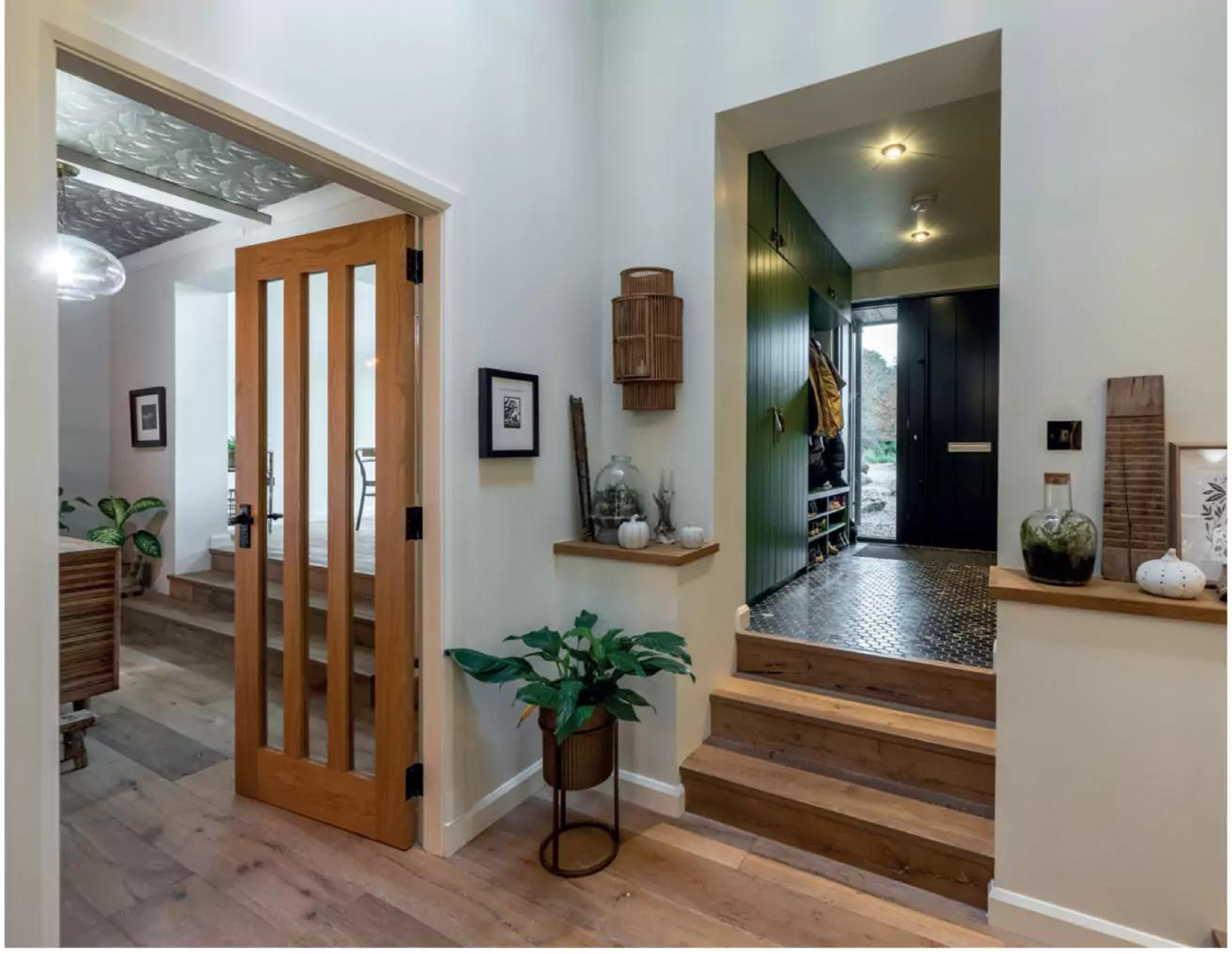
and coats in a new vestibule. Outside, we wanted an additional sitting area, with everything on a raised level."

Word of mouth led the couple to Aberdeen-based Tinto Architecture to creating a much more functional, user-friendly home. Initially, the idea was to submit a planning application for a two-storey extension to create a larger master bedroom suite on the first floor. But with spiralling costs, caused in large part by the pandemic, the final design was for a single-storey addition that features a new dining area with an adjoining vestibule into the hallway. "The advantage of just a ground floor extension is that we have this big apex in the dining area and big pendant lights that creates drama and we wouldn't have had this with a bedroom above, as there would have been a flat ceiling," says Susan. "It makes the dining area better and more exciting as a space."

The local planners were prepared to accept the second single-storey plan as a revision, with the reduced height of the apex. "Don't get too bogged down if things don't work or are unaffordable. And don't worry about going back to the drawing board. Often, it's not the first solution that's the best," says Susan.

Project architect Richard Tinto adds: "The areas in the blockwork extension were underutilised as living spaces, so we were keen that the design reset the balance between the east and west of the house to ensure the whole ground floor was being used."

When the plans for a new master ensuite above the extension fell through, Susan and Rob looked at how they could make their



Left: The former entrance was increased in size to feature a new vestibule area for shoes and coats and storage. They've installed a new Nordan front door

FACT FILE

NAMES Susan & Rob Caslake

OCCUPATIONS Doctors

LOCATION Aberdeenshire

TYPE OF PROJECT Renovation & extension

CONSTRUCTION METHOD Timber frame

PLOT SIZE 1.5 acres

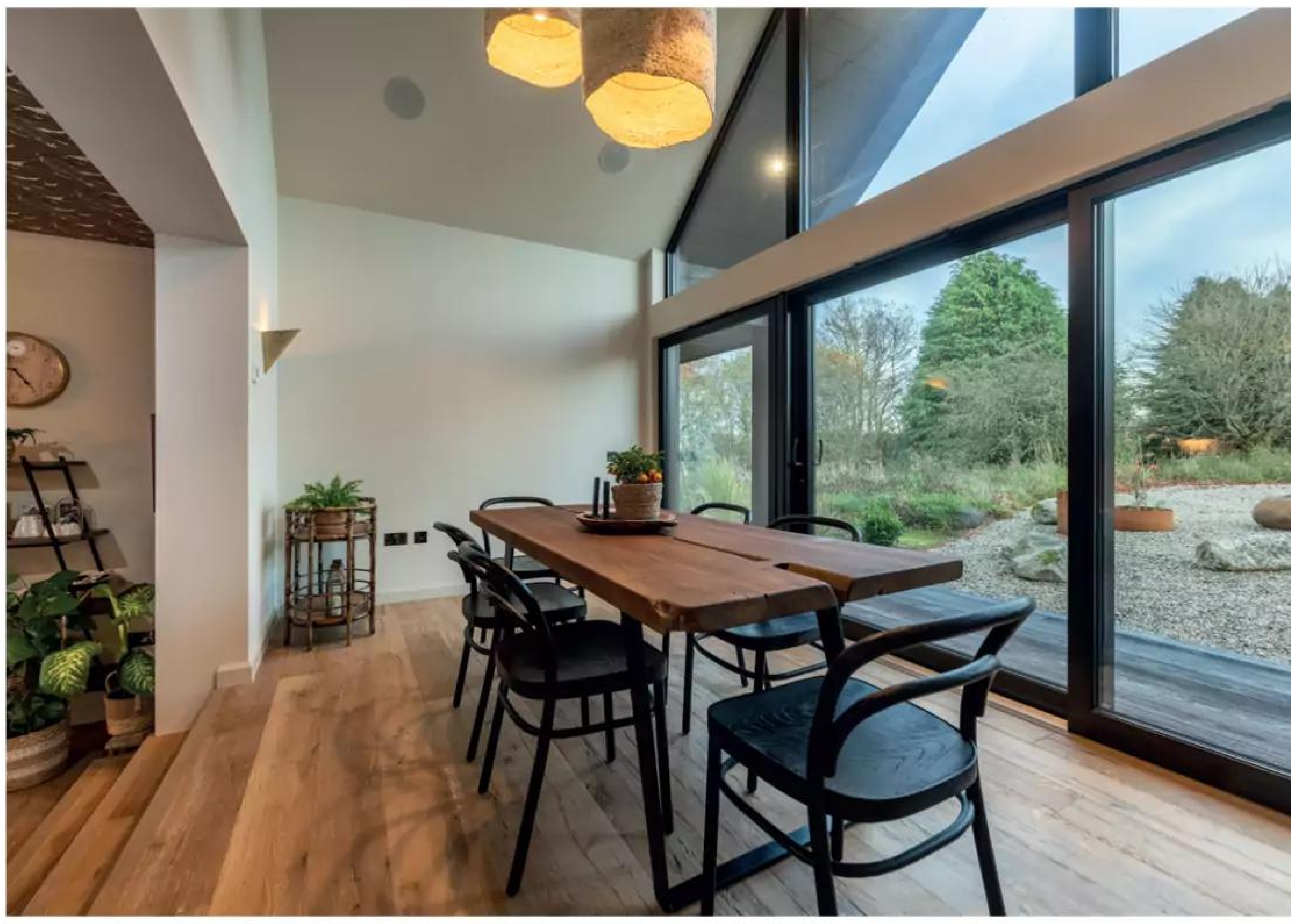
HOUSE SIZE 200m²

PROJECT COST £250,000

PROJECT COST PER M² £1,250

BUILDING WORK COMMENCED June 2022

BUILDING WORK TOOK 16 months



Above: The new dining area was created as a more formal dining space for entertaining. Steps lead up from the cosy sitting room into a dramatic double-height space with vaulted ceiling, statement lighting and a fully glazed gable to take in views of the surrounding garden

bedroom more functional. "Our bedroom was under the eaves and it meant we were always banging our heads when getting in and out of bed! We also didn't have a great amount of storage," says Susan. "We worked with Tinto Architecture with the plan of blocking off the original window in the gable and putting in rooflights as well as creating an area for wardrobes. The bedroom is the same size but by making these changes it works so much better. It was just reorganising the space and making it function better rather than creating an extra storey to the extension."

Architect Richard Tinto says: "Do you really need an all singing, all dancing master suite or could you just give it the love it deserves and come up with what is needed in the brief? The final single-storey scheme we went for is much more subservient to the house and a better solution than a larger, more overbearing structure to the side."

New extension

The extension has created a fully-glazed dining area. The form of this new timber frame structure (with steel support) reflects the line and apex of the original mill building gable that it sits alongside. A new raised sheltered deck wraps around the new dining extension to create an external sitting area to the north-west part of the building.

The dining space features expansive double glazing that allows the surrounding landscape to flood into the building. Although the new structure is contemporary and distinctive, it also sits seamlessly and sympathetically with the original building's traditional gable

WE LEARNED...

IT REALLY HELPED having lived in our home for six years as we had a clear idea of how we used the space, how we lived and how we could improve the space to better suit our lives.

DESIGN IN CLEVER STORAGE and organisation. Having enough storage really supports you to live in a tidy well organised home, which in turn helps your life run so much more smoothly.

TAKE YOUR TIME to find an architect that shares your vision. Great communication and relationships with all those working on site is key to a smooth successful project.

STAYING IN THE HOUSE during the building work meant we lived through three winters with some of the living spaces essentially outside. It's rotten when you look back. But seeing the progress of the project keeps you going.

form. "The cherry on top for me is the wildflower garden that comes right up to the edge of the house. It creates a softness to the way the house sits within the landscape," says Richard.

There is a lightness of touch despite the black finishes to the new extension and sheltered deck, which Susan was keen on from the outset. Black profile metal was chosen for the cladding and roof, with black stained timber to the soffit and decking of the new outside 'sitooterie' (seating area). "The design landed well with the planners as it's not overbearing and the black contrasts well with the granite of the existing building. It clearly works and enhances the house's historic value," says Richard.

Below & above: The previous extension was stripped back to the walls, insulated and tanked to create a secondary defence to the surface water. The existing windows were re-painted in black to tie in with the black of the extension finishes

Survey delays

"The planning application was originally submitted in winter 2020, but a bat survey had to be carried out," says Susan. "This could only take place from May when the bats came out of hibernation. May 2021 was one of the coldest we've had and the bat survey could only be done when there were flying insects. So, there were delays as the bats took longer to come out. Final planning permission came through that August."

Following appointment of the builder, the project went on site at the beginning of 2022. The first phase of works was to complete the civil engineering and drainage works to make sure the area would be dry with no risk of future flooding. This cost around £60,000. "We had a topographical survey done and they drew a drainage plan. The groundworks were carried out in January 2022, coinciding with our entire family having Covid!" says Susan.

They stayed on site for the duration of the main build, which began in June 2022. "The heating downstairs is in two circuits, so the lower ground floor that was flooded was ripped out, but the kitchen diner, study, bathroom and bedrooms were fine," says Susan.

Ideal result

The project was completed in March 2023 and despite the upheaval and delays, the Caslakes now have the family friendly home that they sought back when they bought the house. "Having lived in a building site and a half-flooded house, it doesn't get old being somewhere comfortable – you don't take it for granted," says Susan. "The different ceiling heights and variation of spaces creates the idea that you're in a more interesting house now. The new entrance is great – there's lots of storage to put shoes and bags away. We also like the contrast of the cosy sitting room, which is on a lower level, and the new dining room above which is spectacular with the apex and this huge picture window looking out to the trees and greenery."

Right: Patterned ceilings in the bathroom and lounge bring depth and interest to the interior palette

closer look

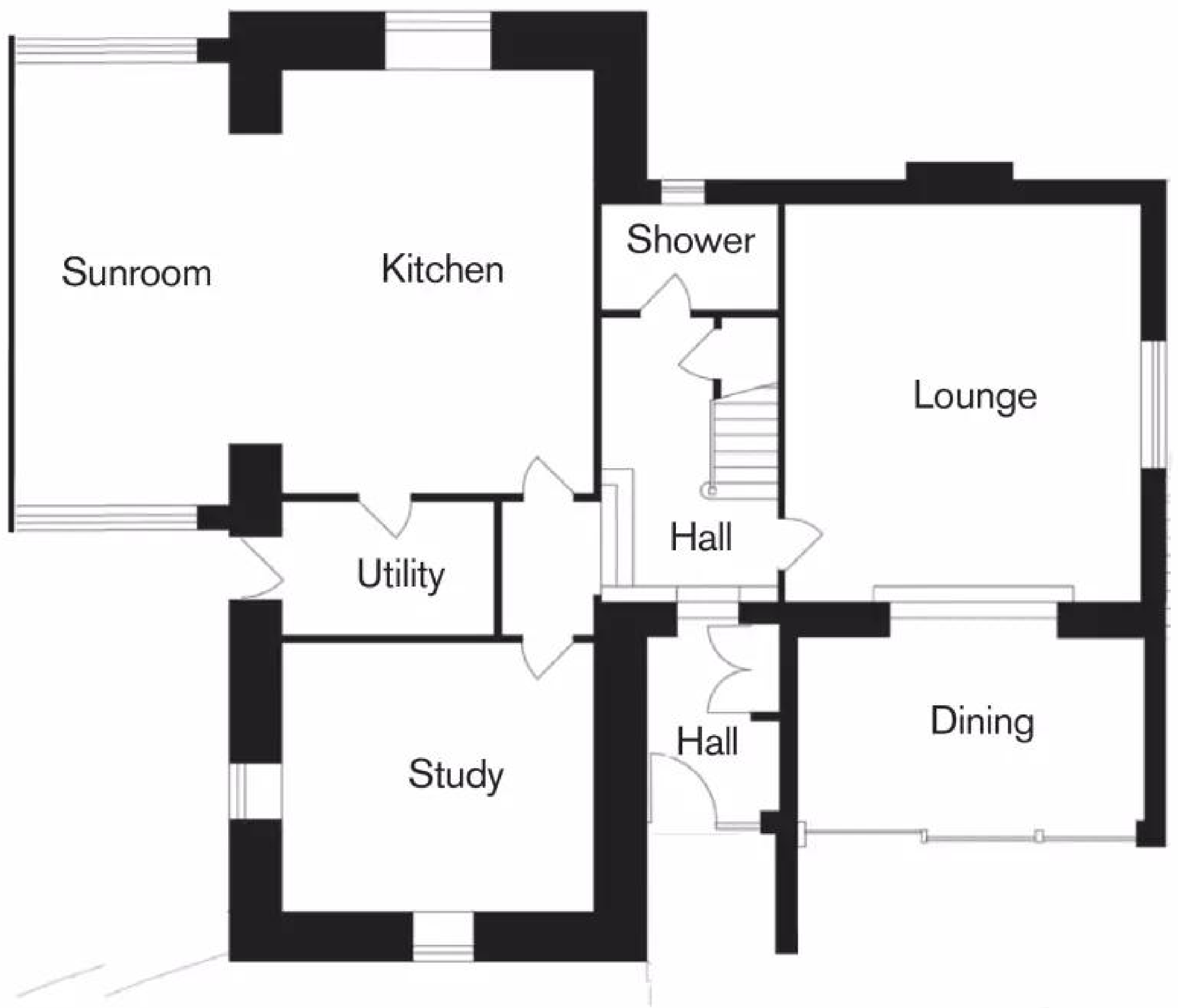
Sheltered outside lounge…

A covered deck sits alongside the new extension, offering the perfect place to sit in the garden whatever the weather. An outside stove brings a cosy ambience and warmth while wired-in speakers enhance the space further, providing the perfect ambience for entertaining. The deck is a composite material chosen for its low maintenance properties as well as aesthetically combining well with the black stained timber soffit to create an enclosed feeling of cosiness. "Outside we wanted an additional sitting area, with everything on a raised level," says Susan. "We've had a lot of good evenings out there with the kids, with the fire on playing board games."

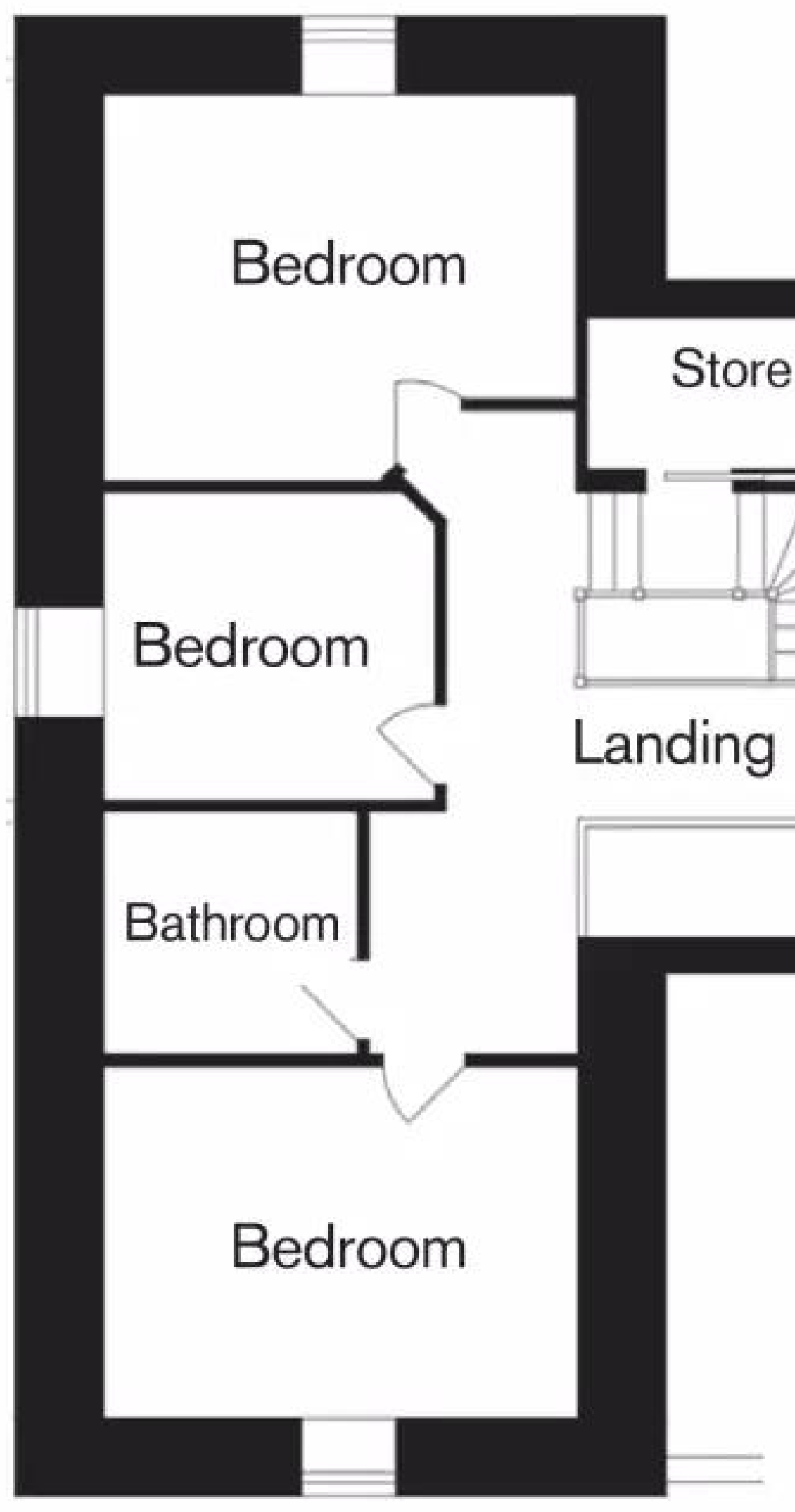
Cosy garden seating

Floor plans

Ground floor



First floor



TOTAL BUILD COST BREAKDOWN

Elements	Cost m²	Cost %	Total cost
Preliminaries	£75	6%	£15,000
Foundations	£23	2%	£4,500
Builders work/drainage	£88	7%	£17,500
External walls & windows	£460	37%	£92,000
Roof structure & covering	£128	10%	£25,500
Floor, wall & ceiling finishes	£55	4%	£11,000
Joinery & fittings	£78	6%	£15,500
Plumbing & heating (incl. bathroom & kitchen)	£80	6%	£16,000
Electrics	£50	4%	£10,000
Decorating	£75	6%	£15,000
Fees	£100	8%	£20,000
External works	£40	3%	£8,000
Grand total			**£250,000**

Note: The costs shown here reflect the original prices for materials, labour and services at the time this project was undertaken. As a general guide, inflation in the construction market runs at about 3%-4% per annum.

Useful contacts

ARCHITECT **Tinto Architecture** 01224 821670 www.tintoarchitecture.co.uk CONTRACTORS **Grant Wilson Joinery** 07971416806 www.grantwilsonjoinery.co.uk **McCombie Builders** 01330 822967 www.mccombiebuilders.co.uk ENGINEER **Ramsay & Chalmers** 01224 560700 www.ramsaychalmers.co.uk CLADDING & ROOF MATERIAL **SSAB** www.ssab.com DECKING **Millboard** 02476 439943 www.millboard.com WINDOWS & FRONT DOOR **Nordan** www.nordan.co.uk ENGINEERED OAK FLOORS **Kahrs** www.kahrs.com STOVE **Scheidel** 01914 161150 www.schiedel.com TILES **Starel Stones** 02382 250503 www.starelstones.co.uk **Topps Tiles** 0800 783 6262 www.toppstiles.co.uk

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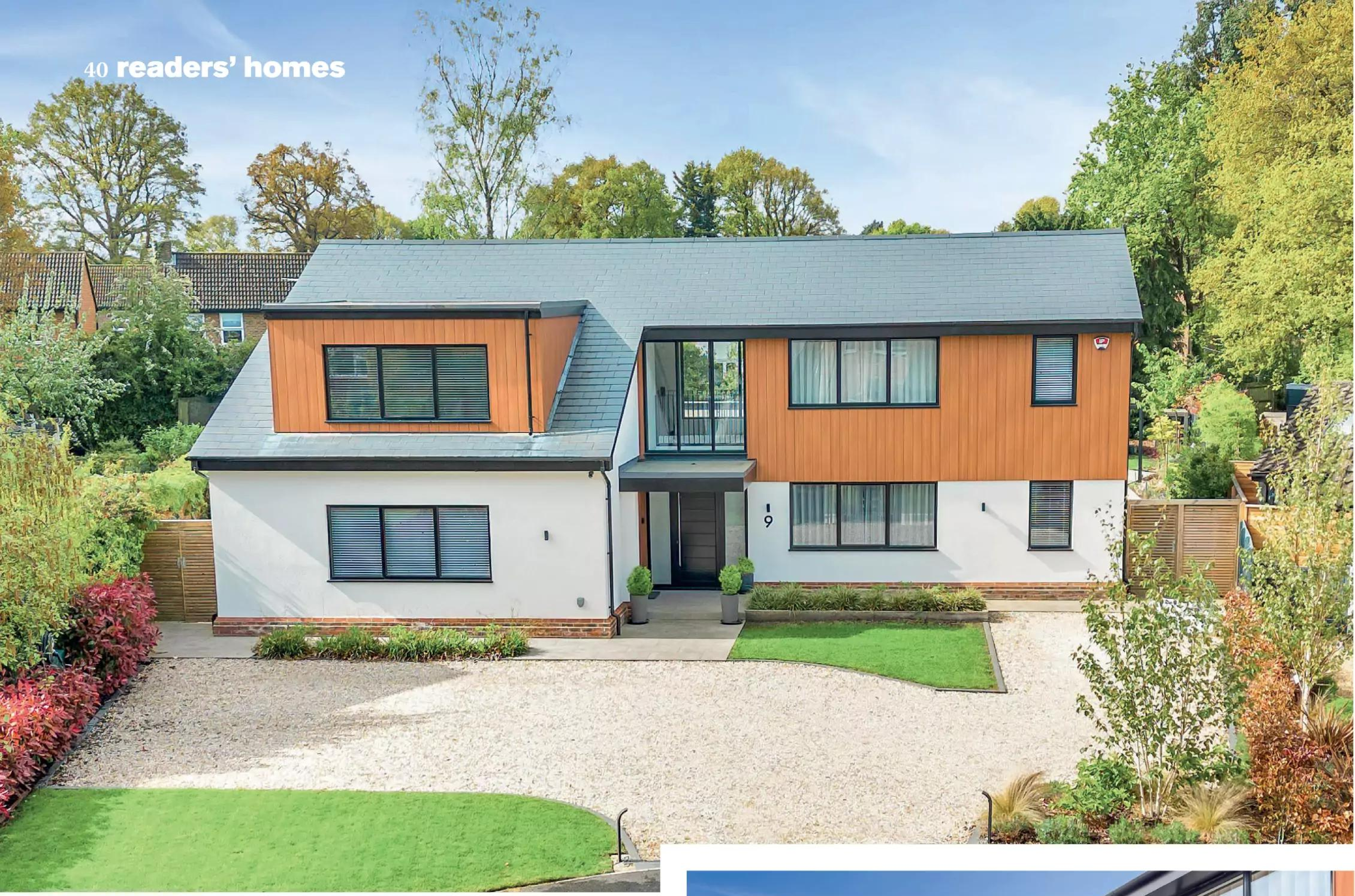


DOUBLE UP

Peter and Sophie Hill bought a 1960s bungalow with the intention of extending. But after being quoted just 10% more to knock down and rebuild, they took the plunge and now live in a new energy-efficient home

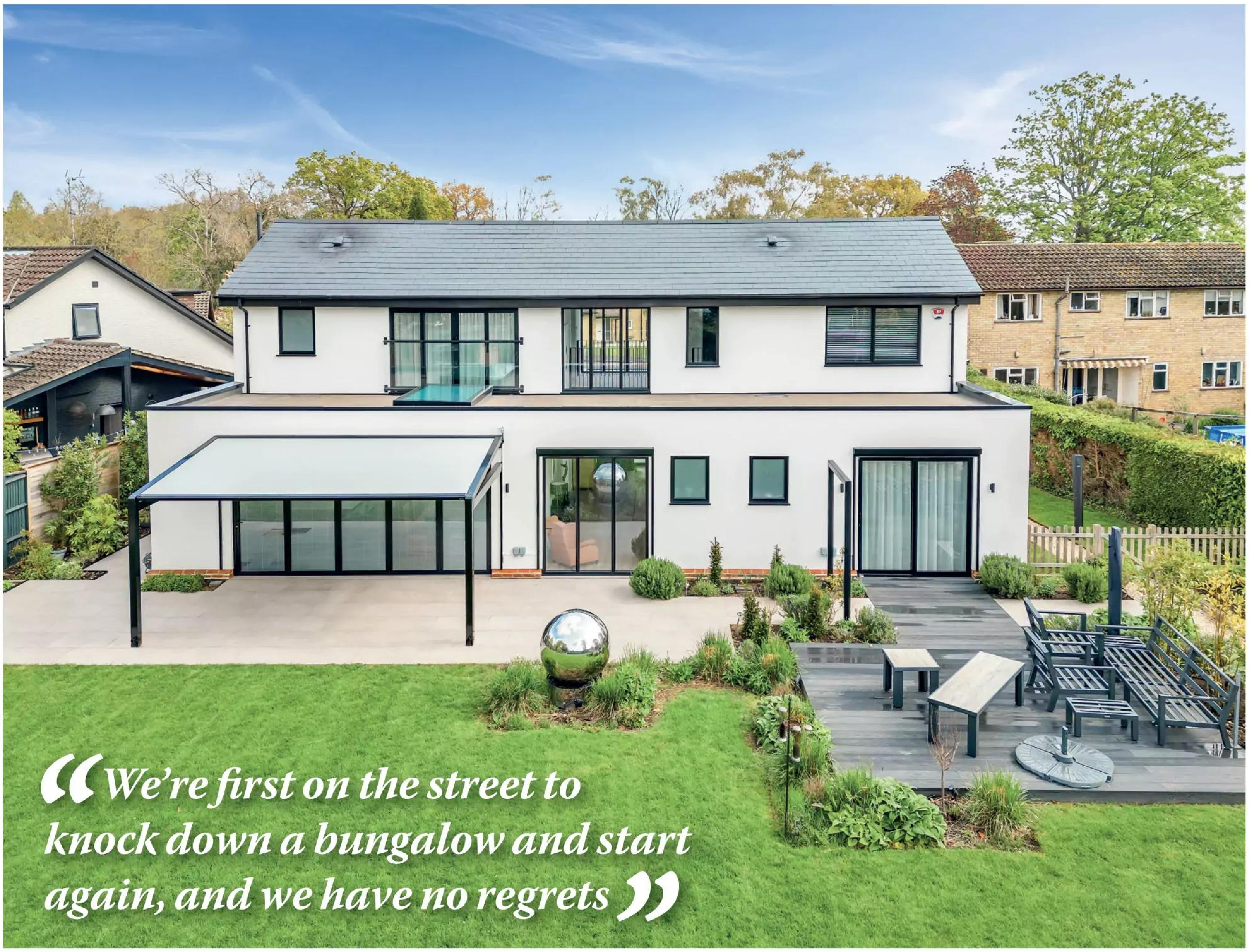
WORDS **JANE CRITTENDEN** PHOTOS **KINGSPAN TIMBER SOLUTIONS**

When Peter and Sophie Hill began house hunting, their initial plan was to downsize in preparation for Peter's retirement, but instead they took a complete U-turn and signed up to a much larger project than they first envisaged. "We'd been unimpressed with new builds and ended up buying a dated bungalow to extend and add a second storey," says Peter. "But quotes were much higher than we expected and with advice from our architect, we decided it would be more cost effective to demolish and start again."

Peter and Sophie weren't living far from East Horsley when they began their search for an easy-to-live, maintenance-free home. New builds proved disappointing with high price tags and small gardens so they decided to sell up, move into a friend's flat, and look for a project house. A three-bedroom 1960s bungalow with a large garden caught their eye. "We were drawn to the plot rather than the old property, which had been owned by a World War II veteran who'd lived into his 90s," says Peter. "Straightaway, we saw the benefit of converting the bungalow into a house and we weren't daunted by the prospect as we'd renovated our previous Victorian home."

Renovation plans

Fortunately, the property was just about habitable so the couple moved in June 2018. They gave the rooms a lick of paint and lived in it for two years. They had clear ideas of what they wanted: a rear extension to square off the back and a second floor above the existing bungalow. "The close is made up of two architectural styles – houses and bungalows – and we knew from talking to neighbours, who'd tried to get planning, that the exterior would need to reflect



> “We're first on the street to knock down a bungalow and start again, and we have no regrets”

Above: A pergola helps shield the kitchen-diner from strong sunlight and also allows a sheltered place to sit outside whatever the weather

the houses,” says Sophie. “This meant having a cat slide roof on the front and a dormer to make the room usable.”

Sophie gathered photos of house styles featuring modern white render and cedar cladding, open-plan kitchen-diners and double-height hallways with galleried landings. “Having lived in a period property with high ceilings, we wanted volume and light,” she says. “We liked the idea of walking into a big hallway with a view to the back garden.”

The couple drew up a shortlist of four local architects and architectural designers they found online. One produced a high end design that an architect friend said would be very expensive to build. “We wanted to work with someone we got on with and who understood our objectives,” says Sophie. “We liked that Rik Hall from Arc8 Projects was approachable. As we went through the design process with him, he'd sit with us, we'd discuss ideas, and he'd rough out sketches – it was an easy relationship.”

Rik took on the couple's brief and also simplified the internal layout. Walls were moved and a central hallway created to divide the main living spaces from quieter rooms. “We could have had a formal sitting room at the front, or a bedroom, but we use the space as a gym,” says Sophie. “We've also got a downstairs bedroom suite for my mum who struggles with stairs – it's very private.”

By April 2019, Rik had submitted plans for alterations and additions to the existing bungalow. The planning officer came to site and was in favour of the design, which was approved six weeks later. “Sometimes people go into planning asking for too much volume or height or propose uncharacteristic materials,” says Rik. “We're always prepared to push the boundaries but will advise clients if we feel they're being unrealistic. It helped that Peter and Sophie kept their design simple and in keeping.”

Change of plan

Rik took on the tender process to find a builder. Three contractors responded, but quotes averaging £617,000 prompted a whole new approach to the project. “Rik advised we could probably build from scratch for a little more money, mostly because a self build is VAT-free,” says Sophie. “Also, if we broadly stuck to the approved design, he could re-apply for the new build knowing it was acceptable in principle and we wouldn't need to start again with planning. We asked a local estate agent for their opinion. They said a brand-new house would have a higher value because of its new spec and energy efficiency – we decided to go for it.”

Peter and Sophie took another look at their approved design before going back to planning (see page 45). They also thought about how they'd build the house. At one of the Build It Live exhibitions, they looked at structural insulated panels and timber frame builds and spoke to a few companies. They plumped for Kingspan Timber Solutions, which delivered fantastic results. The company has a 60-year heritage, but has sadly announced its closure by the end of 2025. “We'd heard good things about timber frame houses because my sister and her husband had built one in Scotland,” says Sophie. “We liked the KTS system because of the fast on-site build time and energy efficiency, with the latter being a planning requirement.”

The project features Kingspan Ultima, an insulated closed-panel wall system. Made in thicknesses from 187mm-237mm, the

FACT FILE

NAMES Peter & Sophie Hill

OCCUPATIONS Retired project & programme manager & marketing director

LOCATION Surrey

TYPE OF PROJECT Self build

CONSTRUCTION METHOD Timber frame

PROJECT ROUTE Architect design with independent project manager

PLOT SIZE 0.25 acres

LAND COST £780,000

BOUGHT 2019

HOUSE SIZE 300m²

PROJECT COST £743,720

PROJECT COST PER M2 £2,479

TOTAL COST £1,524,000

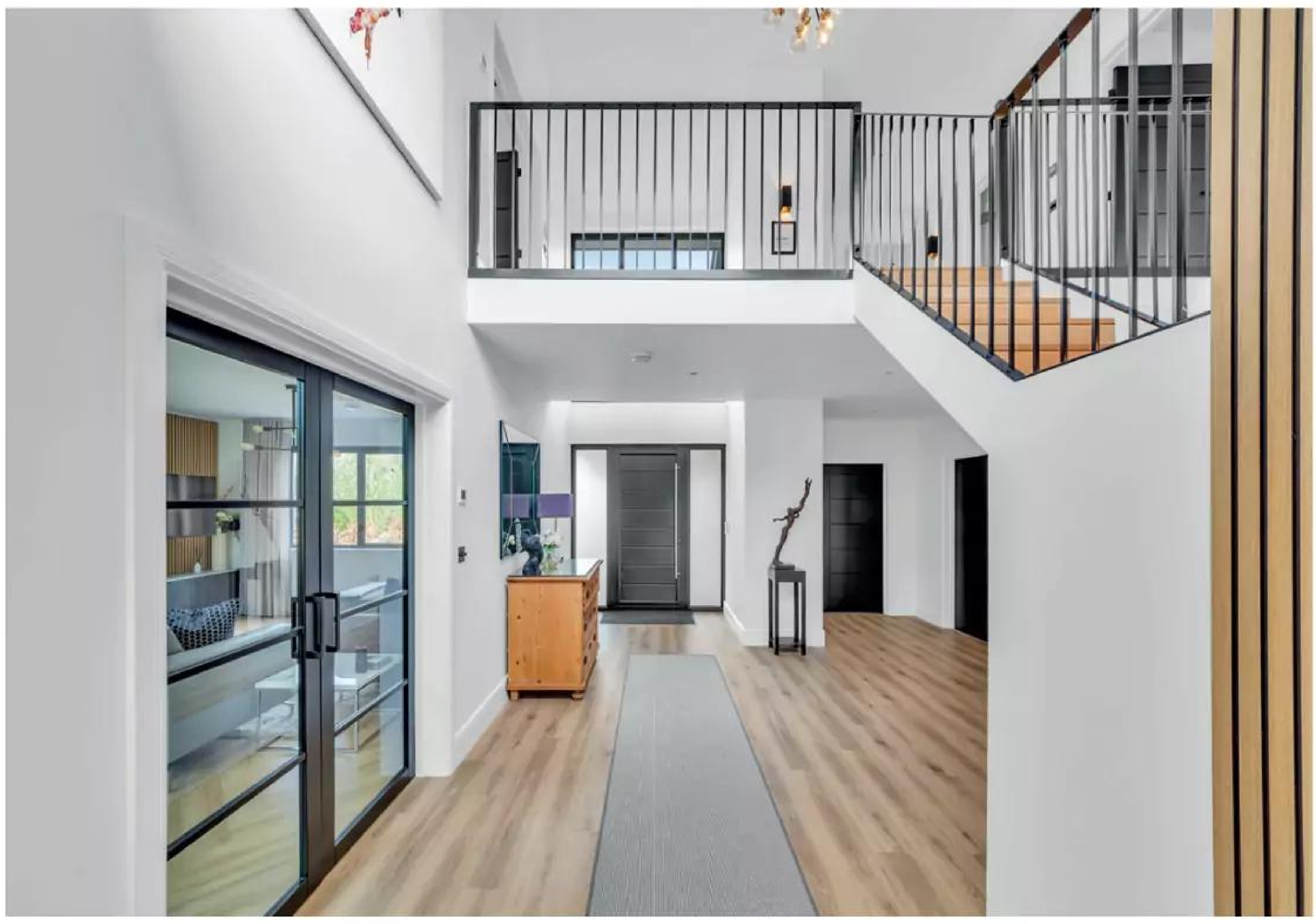
BUILDING WORK COMMENCED October 2020

BUILDING WORK TOOK 32 weeks

CURRENT VALUE £1,900,000

Above & right: The kitchen was designed, supplied and fitted by County Kitchens. The Hills chose a handleless style to suit the contemporary look of their new home

Below right: The design is clean and modern inside and out, with an atrium hallway making an impressive entrance. The double height instantly gives a feeling of space and light, with dual aspect glazing designed to bring in both the morning and afternoon sunlight



factory-manufactured panels provided U-values from 0.16 W/m2K down to 0.11. Panels are delivered to site with external breathable membranes and timber battens already in place.

Pandemic clash

Before going back to planning, the couple asked the same building contractors to re-tender – this time quotes came back averaging £651,000. They also approached an independent project manager (PM). "At the time it made sense to go with an independent PM as

Above: The centralised hallway runs from the front to the back of the house to give a view of the garden as you come in. The front door was moved slightly in the redesign and the tweak has had a big impact on how the entryway feels

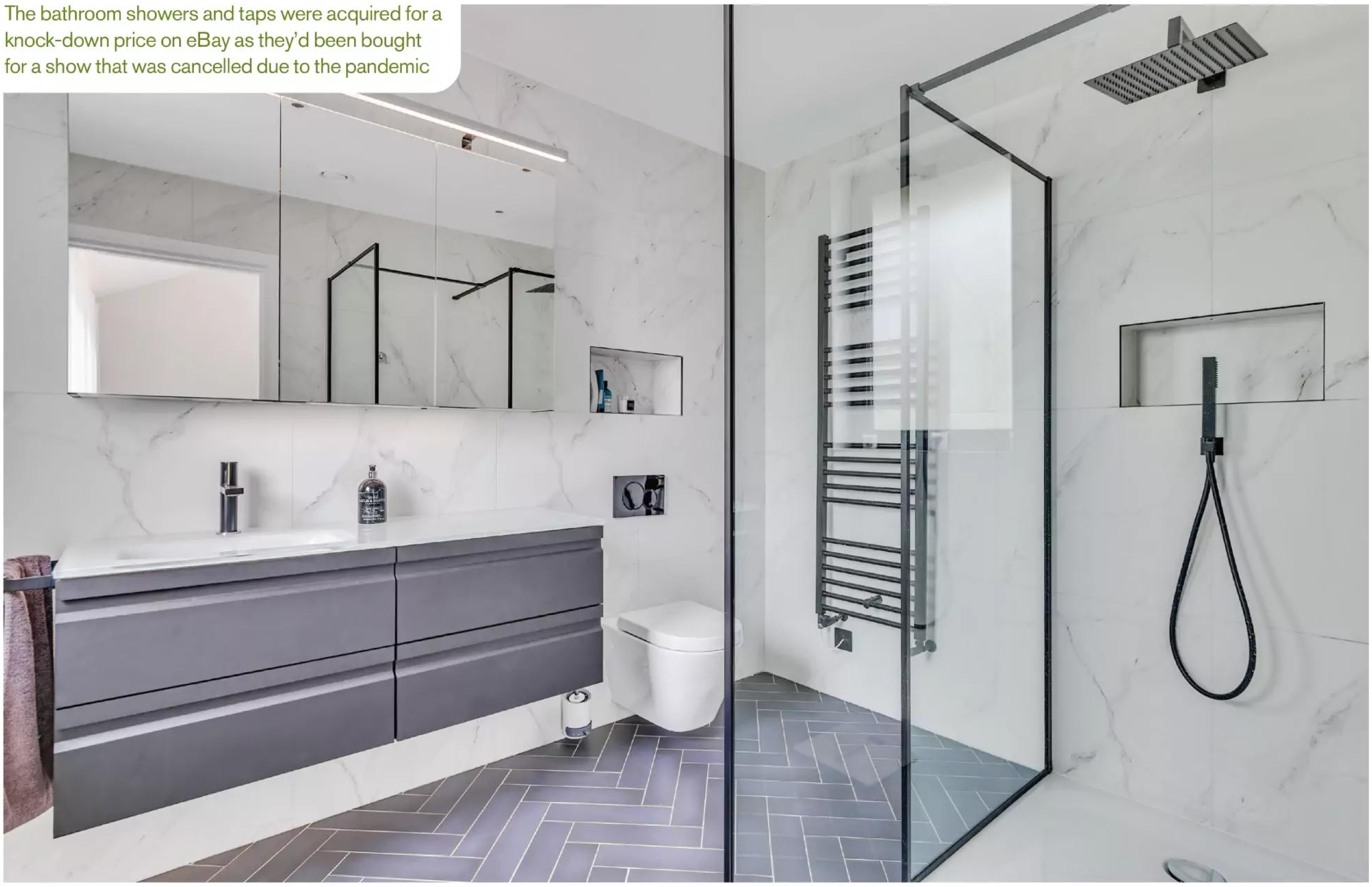
Left: After previously living in a draughty Victorian house, Peter and Sophie are enjoying their highly insulated home. The whole of downstairs is fitted with underfloor heating while the contemporary look of the Aga Rayburn Try View 125 electric fire provides additional warmth and makes a focal point in the room

we didn't need a house builder as such, but trades to take the project on after KTS had built the timber frame structure," says Peter. "The PM's fee was also cheaper than a building contractor's mark-up."

Now confident about moving forward, Rik submitted the couple's revised design in February 2020 and got approval in March – on the first day of the first lockdown. "We already had approval for the second storey so that helped speed up the response," Rik explains. "Often an overbearing house or loss of privacy raise problems but the footprint of the property was set reasonably central on the plot, which meant it wasn't an issue. Plus we'd kept neighbours updated and they were supportive of the project."

Of course, the Covid pandemic immediately impacted progress. Demolition was delayed until October and the couple moved into a rental property nearby. The works soon revealed the bungalow's shallow foundations, damp problems and crumbling pipework, which thankfully they no longer had to be concerned about. However, moving the drainage and dealing with tree roots resulted in the foundations needing to be deeper than expected. "Almost

The bathroom showers and taps were acquired for a knock-down price on eBay as they'd been bought for a show that was cancelled due to the pandemic



WE LEARNED...

STAY IN CONTROL by finding out when key decisions need to be made. Sophie had to ask her interior designer friend for a fast turnaround on bathroom layouts when at short notice the plumber wanted instruction on where to do the first fix plumbing.

IT'S USEFUL TO put together briefing documents for the trades so they have a reference point if they have questions and you're uncontactable at work. Include information like plumbing and electrical plans for each room, skirting and architrave styles etc.

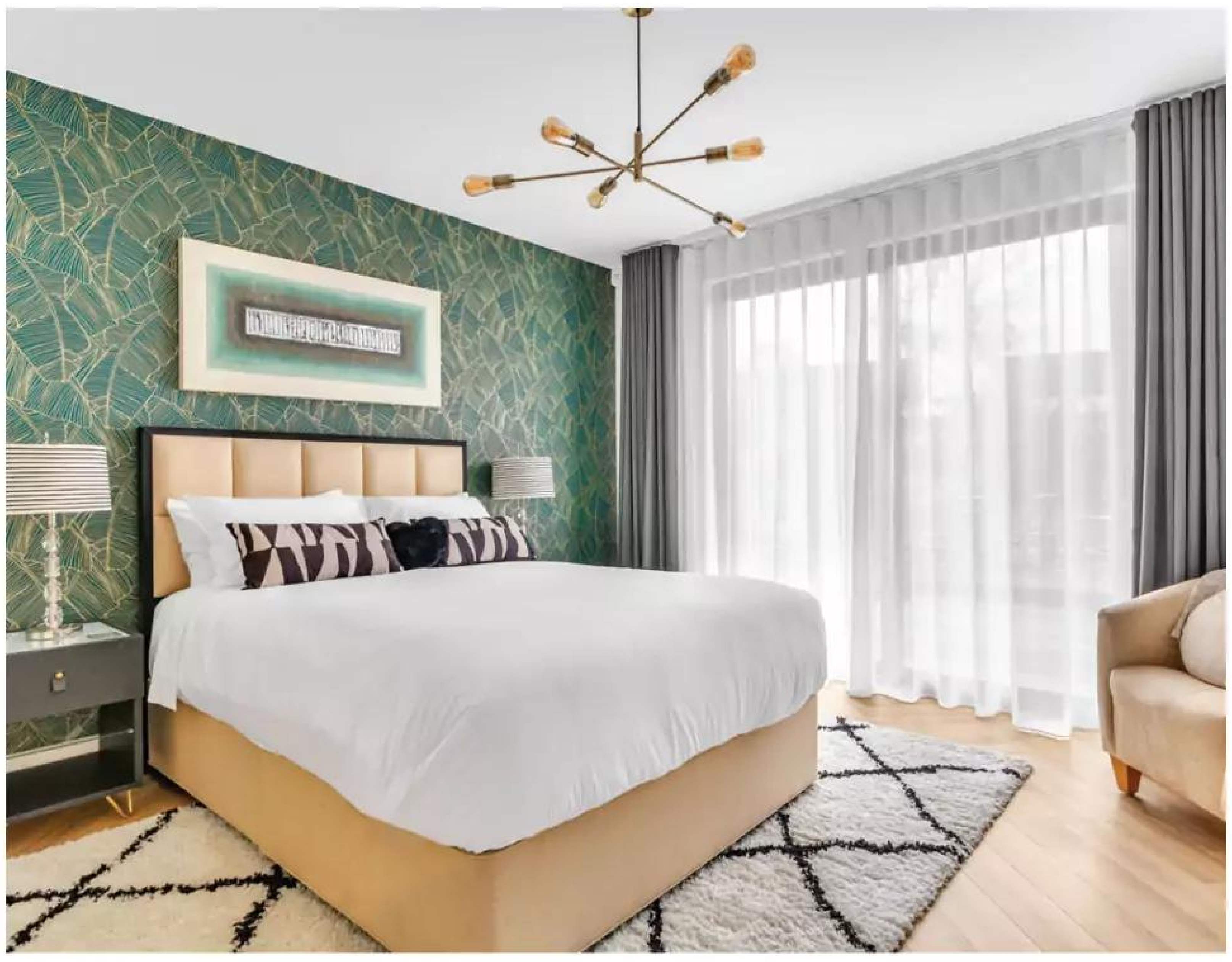
STICKING TO THE APPROVED DESIGN saved us from spending more on architect fees and a new planning application – and we got approval in just six weeks.

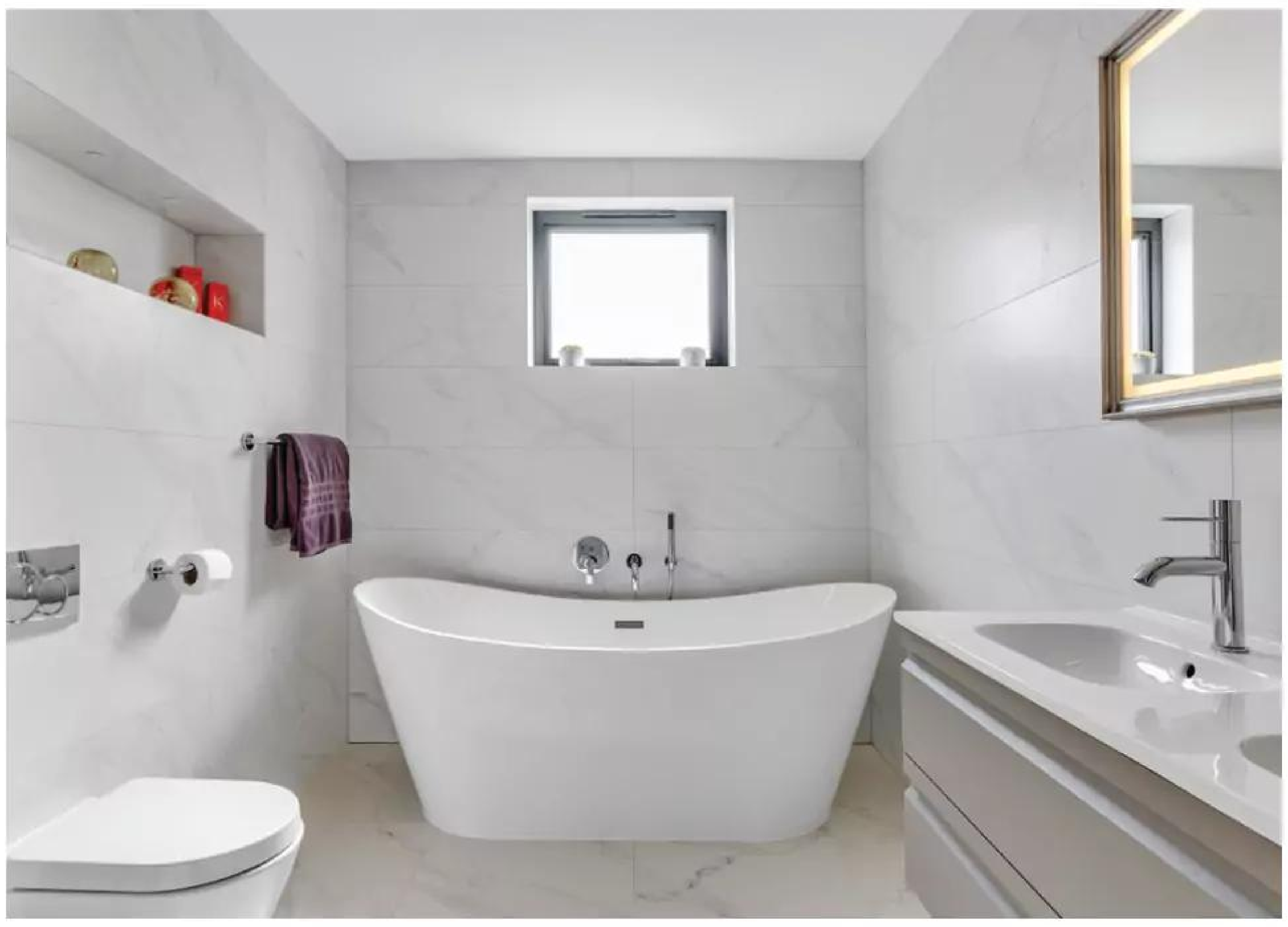
straightaway our groundworks cost jumped from £50,000 to £80,000," says Peter. "The foundations also had to be completely level for the timber frame." KTS delivered the panels in December with a coded assembly system that their erection team followed. There was a minor delay when someone got Covid, which meant the whole team had to isolate, but KTS brought in a new team to carry on.

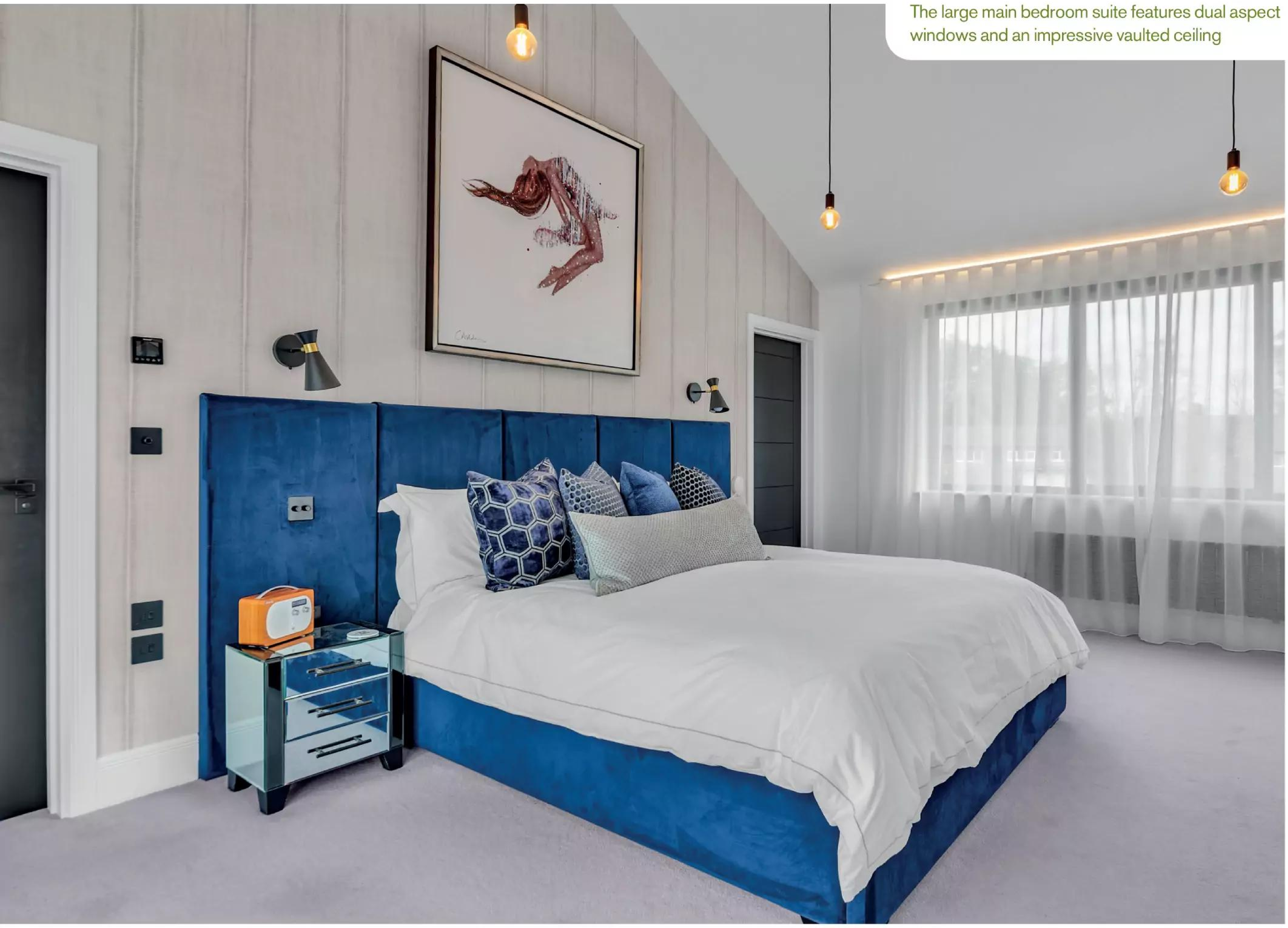
"We had awful weather, it was very wet and snowy, and I was worried about the panels getting wet," says Sophie. "But of course they were fine, the panels had been treated and there was time for them to dry out. KTS got the whole shell built in just six weeks."

Blurred lines

The PM supplied all the trades and came to site a couple of days a week to keep an eye on progress. However, the set-up became fragmented compared to the couple's previous experience working with a main contractor. "When we had a problem, sometimes the line of responsibility was blurred, whereas with a main contractor it's very clear who needs to deal with it," says Peter. "There were







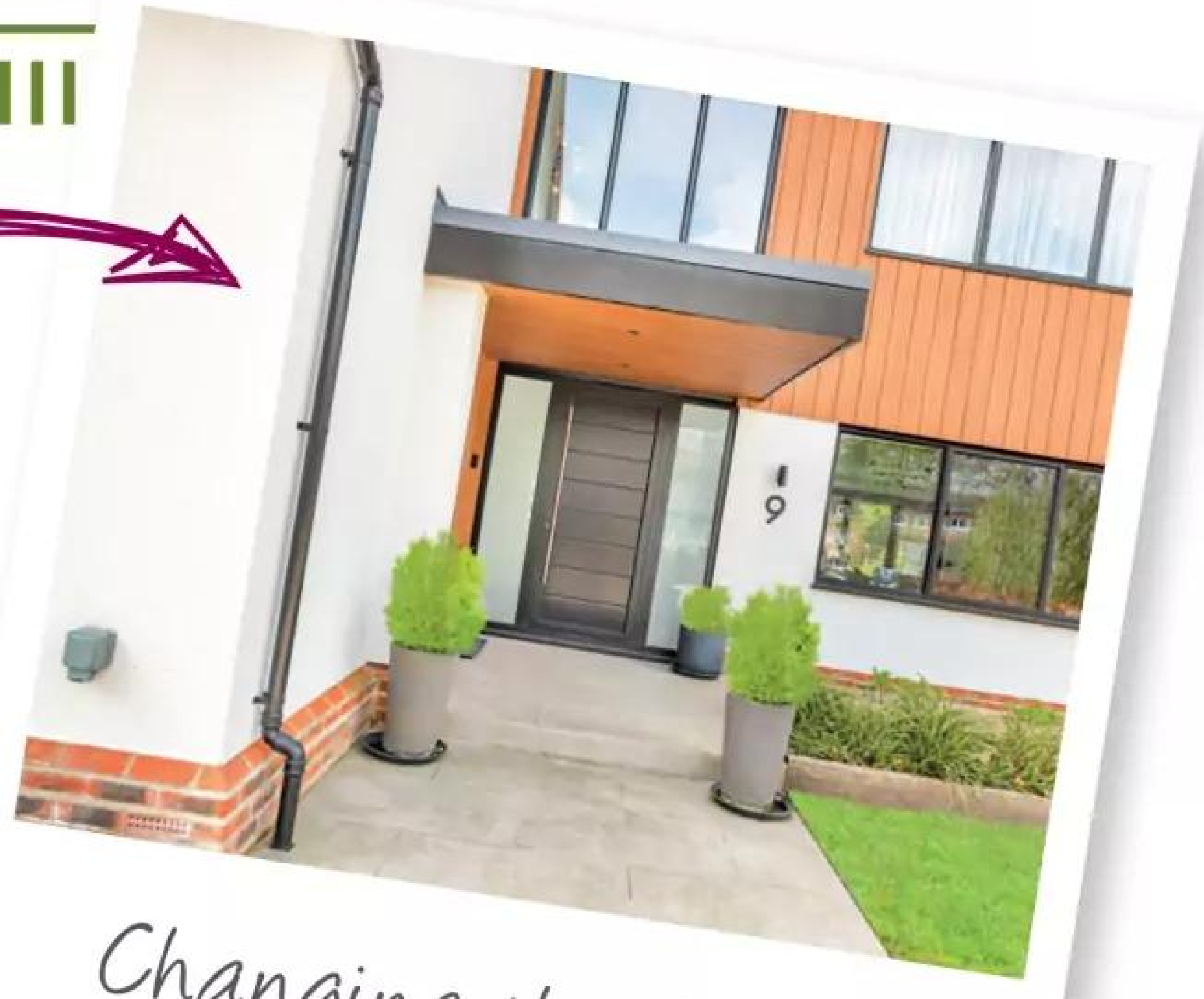
The large main bedroom suite features dual aspect windows and an impressive vaulted ceiling

closer look

From extension to self build…

After deciding to demolish and replace the bungalow, Peter and Sophie tweaked the design with their architect, making changes that would have been invasive and costly if they'd been renovating. An odd shower room add-on to a bedroom on the side of the house didn't need to be in the design anymore, while the plumbing and drainage could be easily relocated. "We also decided we didn't need a study and were able to relocate the plant and laundry to this side of the house and then use the space where the internal garage had been for a boot room-dog room off the kitchen," says Sophie. Rik made the front dormer bigger and raised the roof ridge slightly, creating more headroom in bedrooms. "We were able to push the height because we were building a house rather than extending the bungalow, and the design was in keeping with other homes on the close," he explains.

Another key change was moving the front door to the right, creating more space for the stairs and guest bedrooms above. This would have been an expensive upheaval had they done this in the bungalow renovation. "Although it was tempting to start the design from scratch, we didn't want to add to our architect's costs or pay for a new planning application before we'd got anything agreed," says Sophie. "Sticking to the approved plans was the best way to move forward."



Changing the design

times we were given short notice to make a decision and despite providing an information document, it wasn't always referred to."

Since the pandemic had fast-tracked Peter's retirement, he was able to be more involved than he'd expected. Building during the second lockdown meant Sophie was around more, too. Peter kept an eye on costs with his own spreadsheets. "After we'd moved in, we discovered the snagging was at our cost, too," Peter adds. "That said, all the subcontractors the PM recommended were very good and I can't think of one I wouldn't use again."

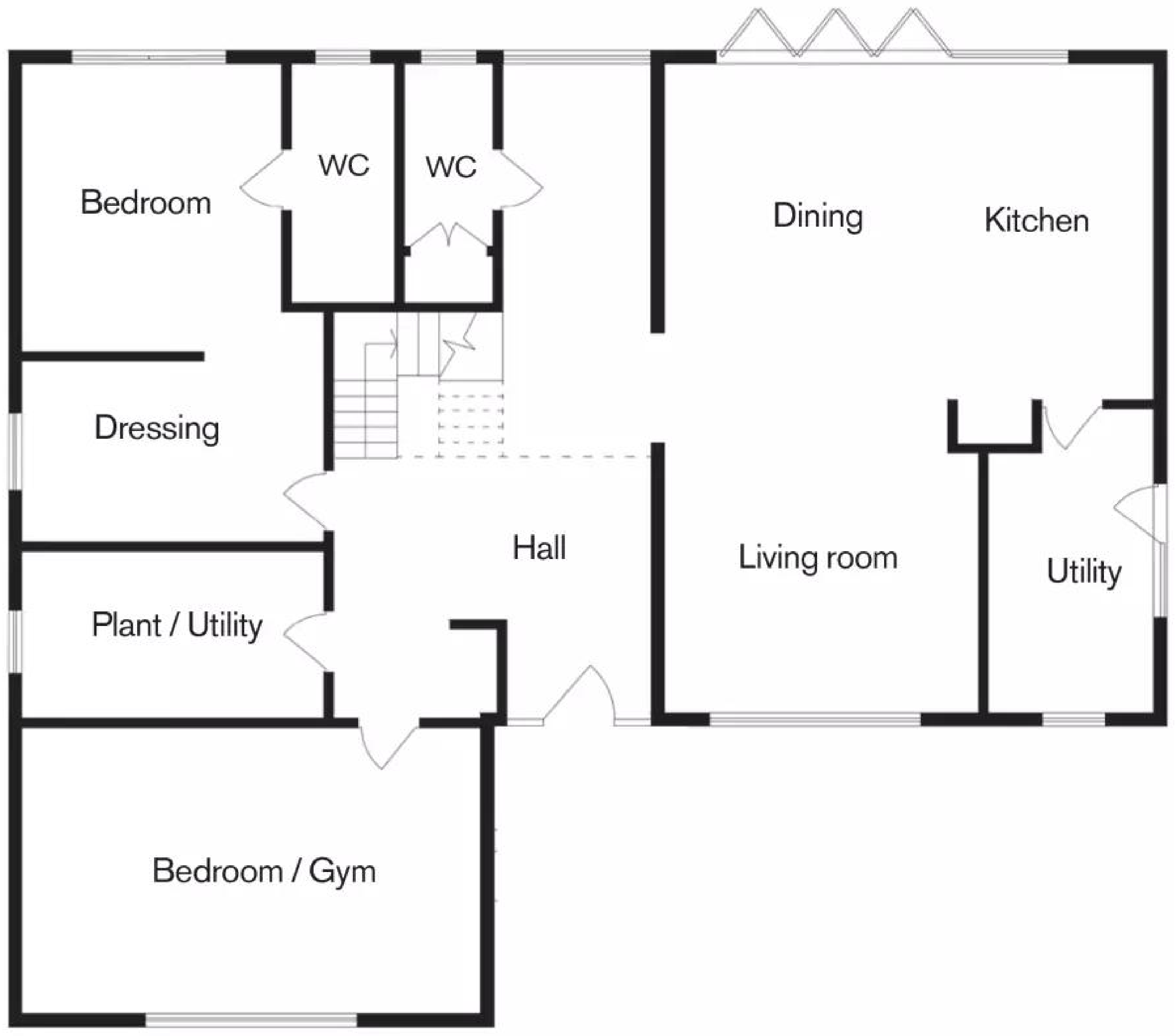
Despite the challenges, the project progressed steadily and the couple mostly managed to avoid materials shortages and price hikes caused by the pandemic. Although, hold-ups on the Suez Canal meant making new choices. "We couldn't source black factory-painted doors anywhere in the UK so we painted white ones on site instead," says Sophie. "I also wanted grey bricks around the external base plinth but compromised with red, which I don't notice now."

The couple moved into their new home within eight months. They began gutting the remains of the garden and started the hard landscaping. The following summer, they hired a garden designer to help advise on plants and their landscape gardener neighbour did all the planting. Along with a higher spec kitchen and bathrooms, the external work pushed up their costs, although Peter and Sophie say the final finishes were important to do the house justice.

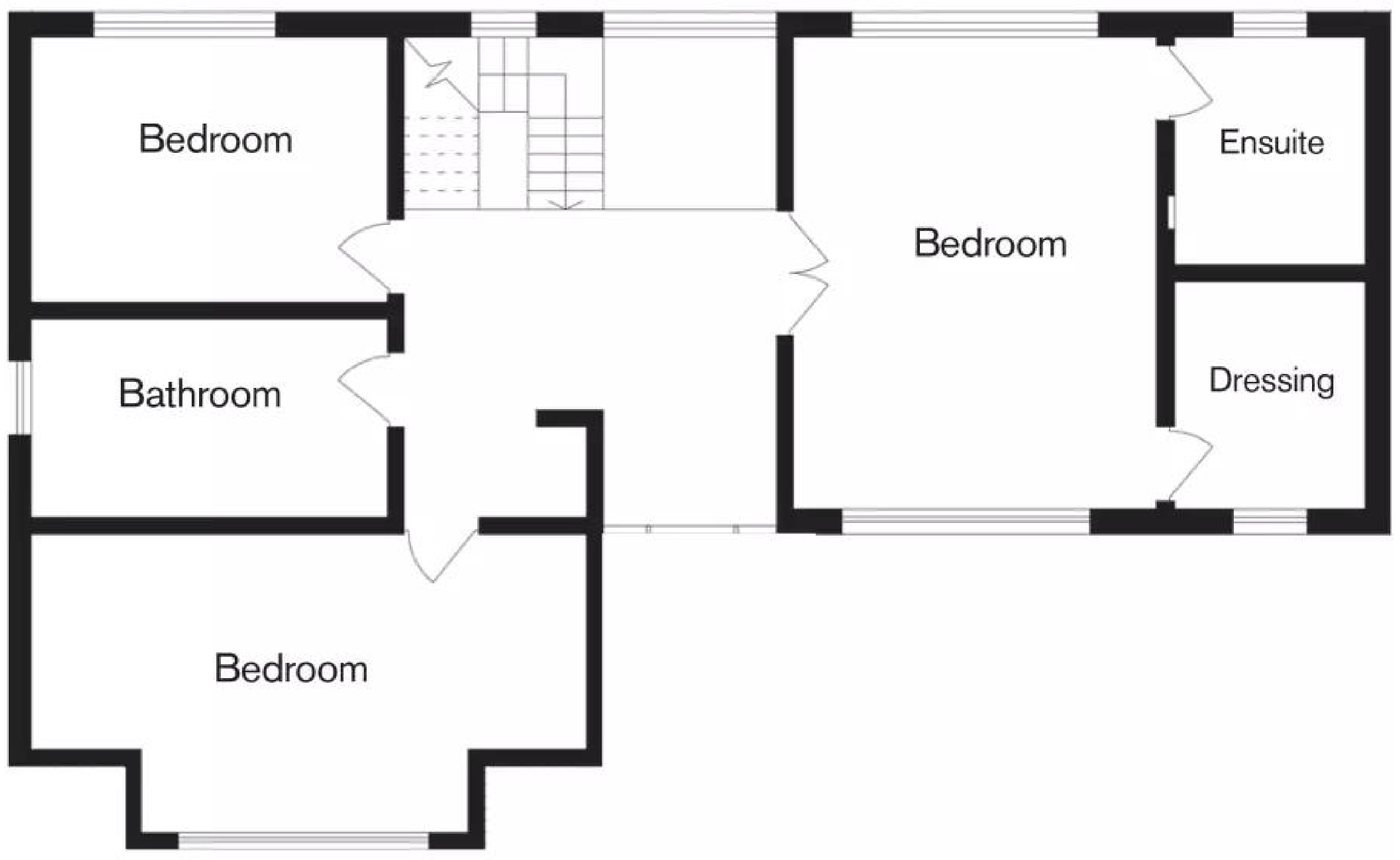
"We're first on the street to knock down and start again, and we have no regrets," says Sophie. "The problems we uncovered in the old bungalow would have been expensive to fix, whereas the new build was a quick and straightforward project. I often pull into our drive and think this is a lovely place to live, we're very fortunate."

Floor plans

Ground floor



First floor



TOTAL BUILD COST BREAKDOWN

Elements	Cost m^2	Cost %	Total cost
Plot purchase fees	£121	5%	£36,400
Design & surveys	£78	3%	£23,400
Professional fees & services	£52	2%	£15,500
Site preparation	£59	2%	£17,800
Demolition, groundworks & foundations	£266	11%	£79,700
Timber frame panel system to shell finish	£260	11%	£78,100
Roof covering	£77	3%	£23,100
Floors, walls & ceilings	£239	10%	£71,750
Roofing	£111	4%	£33,370
Windows & doors	£110	4%	£32,850
Electrics & plumbing	£276	11%	£82,900
Carpentry	£230	9%	£69,000
Kitchen & utility	£103	4%	£30,850
Flooring	£50	2%	£15,000
Decorating & tiling	£91	4%	£27,400
Hard landscaping	£225	9%	£67,400
Garden & associated buildings	£131	5%	£39,200
Grand total			**£743,720**

Note: The costs shown here reflect the original prices for materials, labour and services at the time this project was undertaken. As a general guide, inflation in the construction market runs at about 3%-4% per annum.

Useful contacts

ARCHITECT **Arc8 Projects** 01372 377351 www.arc8projects.com TIMBER FRAME PANELS **Kingspan Timber Solutions** 01767 676400 www.kingspantimbersolutions.co.uk ROOFER **TM Roofing Specialists** 01252 851719 www.tmroofing.com **Aztec DG** 01425 615382 WINDOWS & DOORS **Arkay Windows** 01923 803923 www.arkaywindows.com PLUMBER & AIR SOURCE HEAT PUMP **KD Jones Heating Engineers** 01737 211376 www.kdjones.co.uk ELECTRICIAN **RH Electrical Design & Installation** 07831 134109 JOINER **J&H Harris Carpentry Liphook** 07970 160954 www.jandhharris.co.uk KITCHEN **County Kitchens by Sigma 3** 01372 467464 www.sigma3.co.uk FLOORING **Amtico** 0121 745 0800 www.amtico.com GARDEN DESIGN **Cedar Nursery** 01932 862473 www.landscaping.co.uk PLANTS & PLANTING **The Plant Hunter** www.theplanthunter.garden

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BUILDING WITH SIPS

Scarlett Deamer explores the benefits, costs, design potential and key considerations for this offsite construction method

Above: Design by Q Build and featuring the SIPs Eco Panels structural system, this new house achieves great thermal efficiency and airtightness while withstanding the exposed coastal climate

Modern construction methods are evolving rapidly, with factory-made systems offering faster build times, improved energy efficiency and great design flexibility. One approach that you have probably heard of is SIPs, or structural insulated panels, which delivers sustainable, high-performance, beautiful homes. Here, I'm exploring how this build route works, its eco credentials, the key design possibilities and the associated costs.

The basics

SIPs are precision-engineered structural panels consisting of an insulating foam core, usually EPS (expanded polystyrene) or XPS (extruded polystyrene), sandwiched between two facings, typically oriented strand board (OSB). This combination forms a highly durable and airtight structural envelope that can be used to create walls, roofs and floors for a wide range of building types. The panels are manufactured offsite in a controlled factory environment – ensuring consistent quality and accuracy – and then supplied the exact dimensions required for your specific house design. Once completed, they are delivered to site as a ready-to-assemble kit, allowing for quick and efficient construction.

Design potential

If you're worried that using a prefab panel system might restrict you to an unoriginal, boxy home – fear not. This couldn't be further from the truth when it comes to SIPs. "The flexibility in design and ease of construction mean there are no limitations to what can be achieved, offering complete freedom," says Ian Clay, founding partner at SIPS@Clays. As the panels form a strong structural shell, internal load-bearing walls are often unnecessary,

This bespoke five-bedroom home by JML SIPs showcases the versatility and design potential of SIPs. The scheme features a stone and timber-clad exterior, helping the new home blend in with the surrounding landscape allowing for creative architectural features. “The system can be engineered to suit bespoke layouts, large open-plan spaces, impressive vaulted ceilings, expansive areas of glazing and complex roof structures,” says Matt Banks, managing director at SIPs Eco Panels. This versatility makes it possible to create both traditional and modern style properties with ease.

SIPs manufacturers typically collaborate closely with designers from the earliest stages to ensure the buildability of a project – giving you peace of mind that your dream home can become a reality. Working with accredited companies, such as STA Assure Members, is a great way to ensure project success.

Performance benefits

SIPs are known for their excellent thermal performance and airtightness. “Low U-values can be achieved with thinner wall build-ups compared to other build systems, but more importantly, airtightness levels are exceptional for SIPs – meaning they are great for those looking to achieve a Passivhaus-standard home,” says Derek McIntyre, SIPs director at JML SIPs. The combination of a continuous insulation layer and precise factory production ensures consistent energy efficiency across the build.

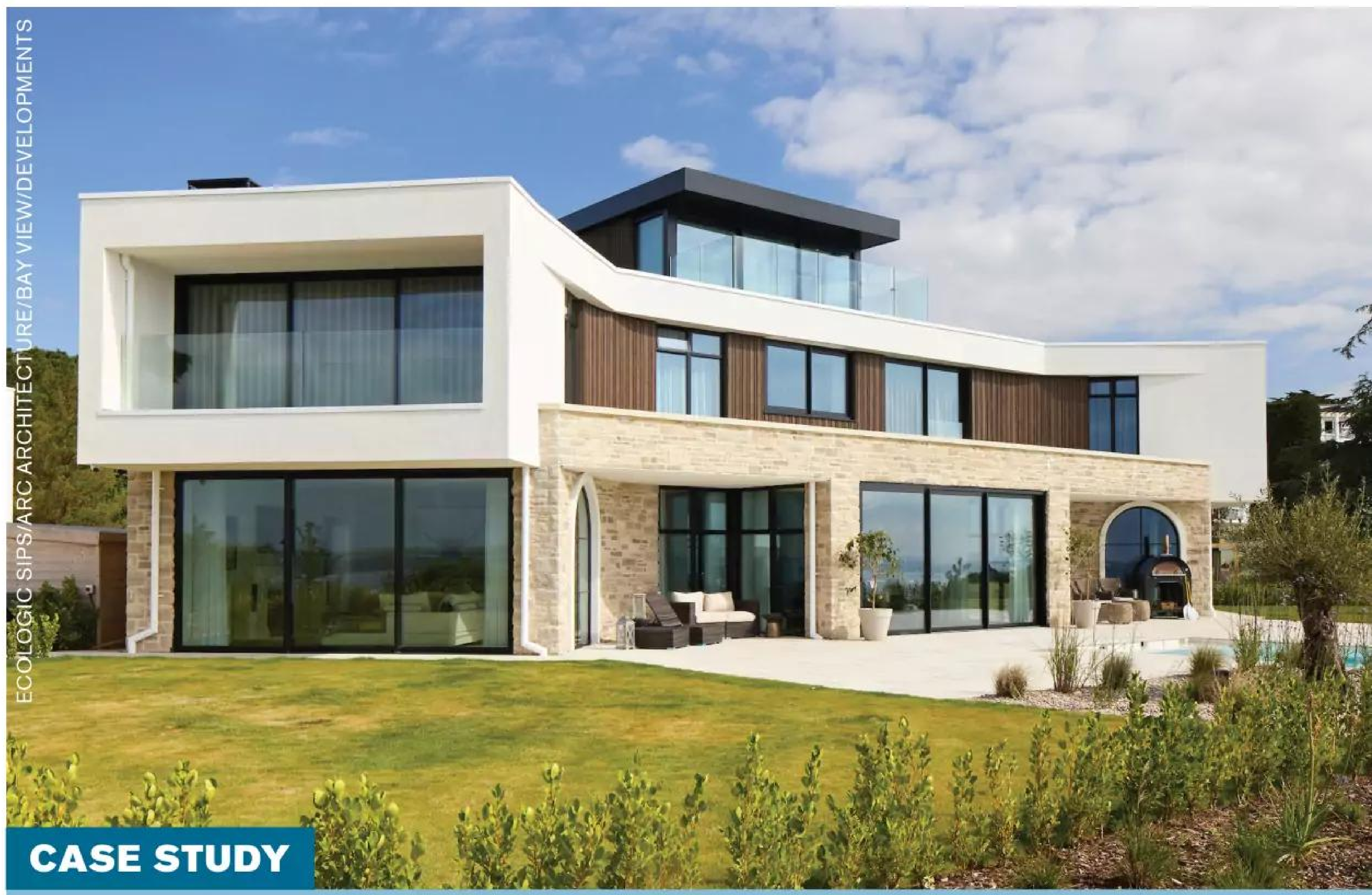
When constructed with attention to detail, SIPs can deliver impressive airtightness results. “Typically, masonry builds with additional membranes and taping may achieve an airtightness rating of 3-5m^3/hr/m^2 @50 Pa, but this depends on workmanship and takes a lot of time and effort to reach,” says Matt. “With careful detailing and standard airtightness taping, SIPs structures can very comfortably reach below 1m^3/hr/m^2 @50 Pa.” Such levels of performance help maintain stable indoor temperatures and minimise heat loss, which contributes to lower energy use and improved comfort year-round.

To achieve the intended performance levels, it’s essential that all joints are sealed correctly, especially around windows and doors, and that any openings made by follow-on trades are properly closed after installation. This will help to minimise thermal bridging, which is a major win for those aiming for high levels of efficiency.

Sustainability

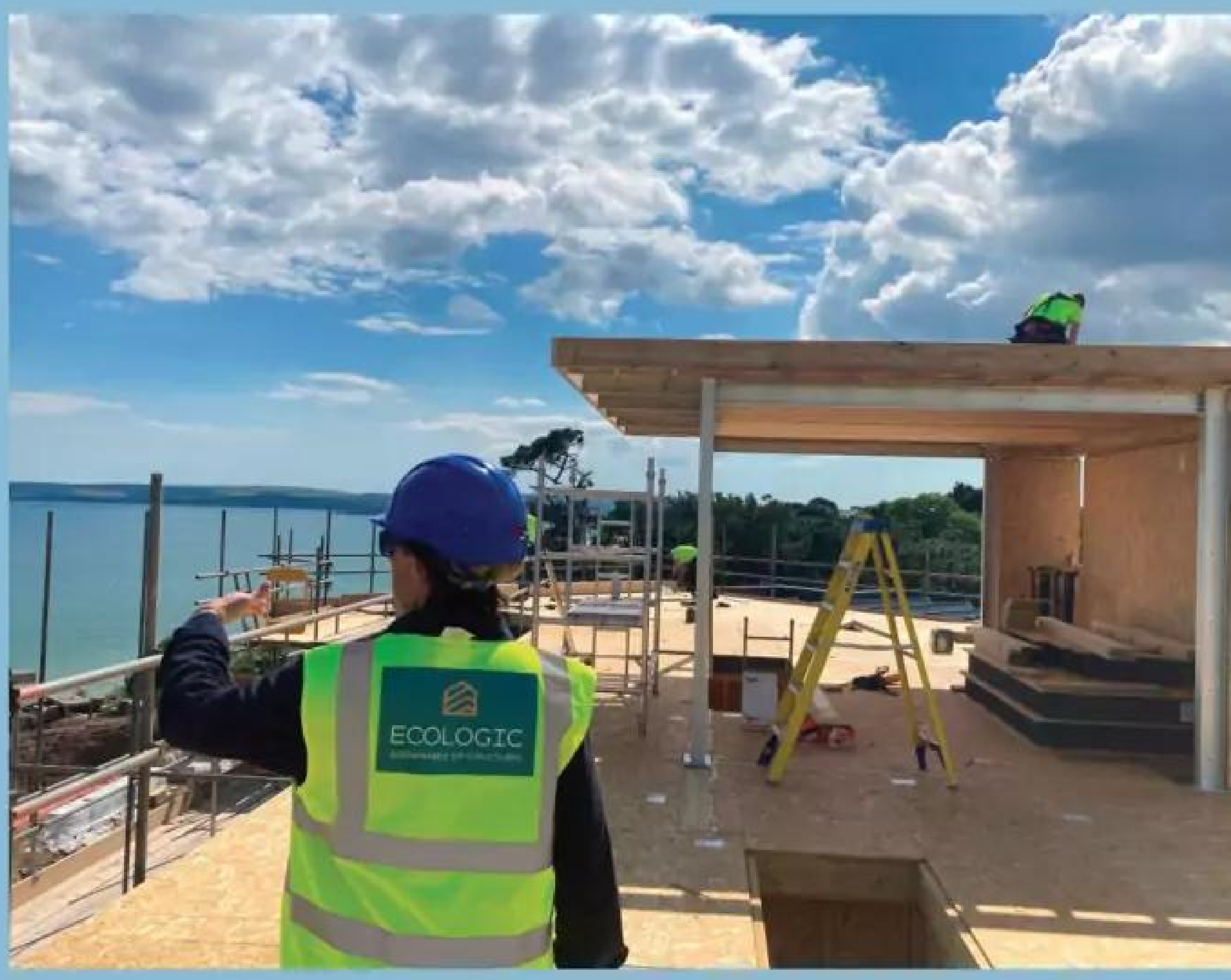
SIPs offer strong environmental benefits throughout their lifecycle. “The SIPs panels are manufactured with timber from responsibly managed sources and the high-performance insulation core significantly reduces the home’s lifetime carbon footprint by lowering heating demand,” says Derek.

End-of-life considerations are also built into the system. “The EPS insulating core can also be recycled if you choose to demolish part of your home to make way for a new extension, for example,” says Matt. This ability to recycle key structural components ensures that the SIPs materials can be reused rather than sent to landfill. “If you add this to the offsite manufacturing (which provides minimal waste), fewer deliveries to site, less construction traffic and the reduced thermal bridging in a SIPs structure, this build method is an ideal solution for those wishing to take on a low-carbon, eco-friendly project,” says Ian.

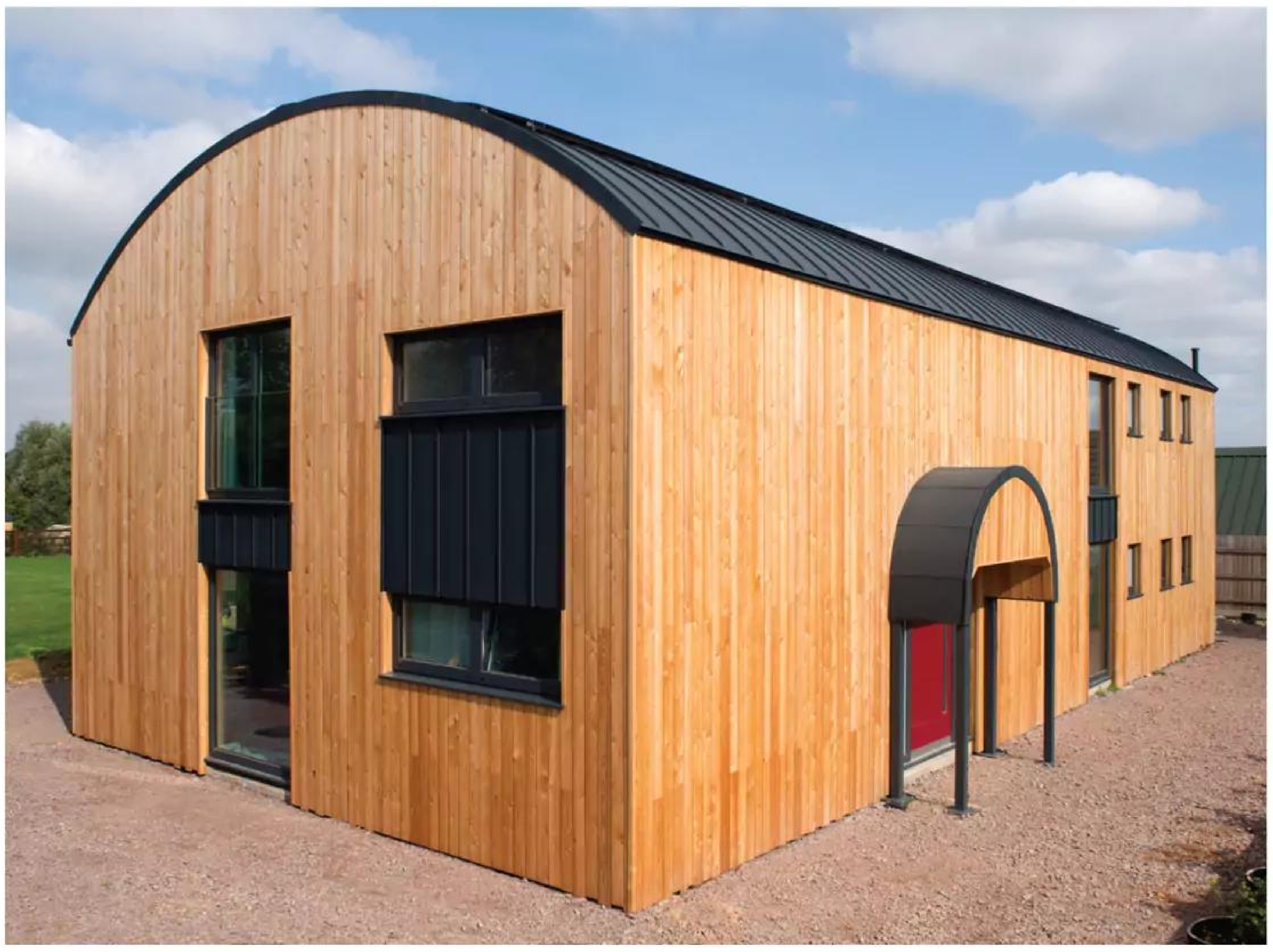

ECOLOGIC SIPS/ARC ARCHITECTURE/BAY VIEW/DEVELOPMENTS

CASE STUDY

Located on a stunning clifftop in the prestigious Canford Cliffs area of Bournemouth, this showstopping home and annexe were designed by ARC Architecture and constructed by Ecologic SIPs. The project combines contemporary style with exceptional energy efficiency, taking full advantage of the site’s elevated position with sweeping views across Poole Harbour and the beautiful nearby blue flag beaches of Sandbanks.



The use of SIPs was integral to achieving the home’s modern architecture and performance. This building system allowed for precise construction, rapid installation and superior insulation, ensuring year-round comfort and reduced energy consumption. Its versatility also supported the inclusion of large, glazed walls and clean architectural lines, perfectly complementing the picturesque coastal setting.


Left: Built using the Glosford SIPs system, this modern Dutch barn-stye home showcases SIPs’ ability to create striking design details, such as this vaulted curved roof

EXPERT FAQ

George Gifford, commercial director at Glosford SIPs, answers your questions about building with SIPs

Q What are the foundation requirements for a SIPs build?

These buildings are relatively lightweight and compatible with many types of house foundations. The primary factor that dictates foundation type is the ground conditions of the site. Trench foundations, piled foundations and ground bearing insulated rafts are all commonly used. Accuracy is vital in the substructure: it must be level, square and engineered in line with the loadings provided by the SIPs manufacturer.

Q What external finishes can be used with SIPs?

A SIPs provide a strong, flat and well insulated substrate for a wide range of cladding systems, which makes them extremely versatile. The key factor to note is there must be a ventilated cavity between the panel and cladding finishes to dissipate any condensation that naturally forms on the breather membrane. Lightweight cladding systems such as timber, render board, metal, tiles, brick slips and composite boarding can be supported directly off the SIPs with vertical battens. Full masonry systems will generally have a 50mm cavity and be supported from ground level upwards. Where this is not possible, such as over large-format bifold doors, the SIPs design will need to incorporate suitable masonry supports.

Q Is it tricky to find a builder who has worked with SIPs?

A Whilst SIPs is considered a modern method of construction, it follows many of the principles of timber frame, which has been used for centuries across the UK. It is not necessary to select a builder that has worked with SIPs previously. However, it is of paramount importance that the substructure is installed within tolerance and to the best standard possible. Once the SIPs have been erected, the follow-on trades will have a square, level and insulated substrate to work with. Both indoor and outdoor trades can start simultaneously, unlike conventional timber frame, which vastly reduces build times.

Q Is it hard to make structural alterations post-build?

A Homes constructed using SIPs are no more difficult to extend or alter than any other form of construction, providing you have selected a well-known and reputable company to undertake the SIPs superstructure. Make sure your supplier gives you fully detailed as-built drawings, structural calculations and warranty information once handover of the build has taken place. These documents can all be used to ascertain future opportunities for any alterations.

Whalley Old Road, built by SIPS@Clays, is a spectacular three-storey SIPs home with six bedrooms, four bathrooms and a roof terrace. Its high-performance design features a concrete basement, double-height ceilings and Corten steel and burnt larch cladding

Costs

SIPs has a reputation in the construction industry for being a more expensive building method when compared to traditional timber frame or blockwork. On average, the supply and installation of the pre-insulated superstructure might come in at around £350-£500 per m^2. However, the total cost of a SIPs home will always depend on individual factors such as the level of internal finish, the size of the build, the amount of glazing you want to incorporate into the scheme and the specification choices you make throughout the interior and exterior design process.

It's important to consider the wider picture when comparing costs, too. "Substantial savings are made with the offsite manufacturing, speed and efficiency of construction, reduced on-site labour costs, dry build process and having a predictable build schedule," says Ian. Traditional site-based build methods often carry hidden expenses – such as ongoing scaffolding and site welfare fees – that can make SIPs more competitive once the full build process is taken into account. "A kit is often about 20% of a home's total build cost, so if a SIPs kit is say 10% dearer for the superstructure than another system, this will only add 2% to your budget," says Mark Stevenson, Build It's project management expert. So, the price difference is often smaller than it might first appear.

In short, you will be paying more money upfront if you choose this build route, but in the grand scheme of things, a SIPs build can lead to long-term savings through its excellent thermal efficiency and reduced running costs.

CONTACTS **ARC Architecture** 01202 479919 www.arcarchitecture.uk **Ecologic SIPs** 01425 839291 www.ecologic-sips.co.uk **JML Sips** 01764 663271 www.jmlsips.co.uk **SIPS Eco Panels** 01592 631636 www.sipsecopanels.co.uk **SIPS@Clays** 01756 799498 www.clays.com

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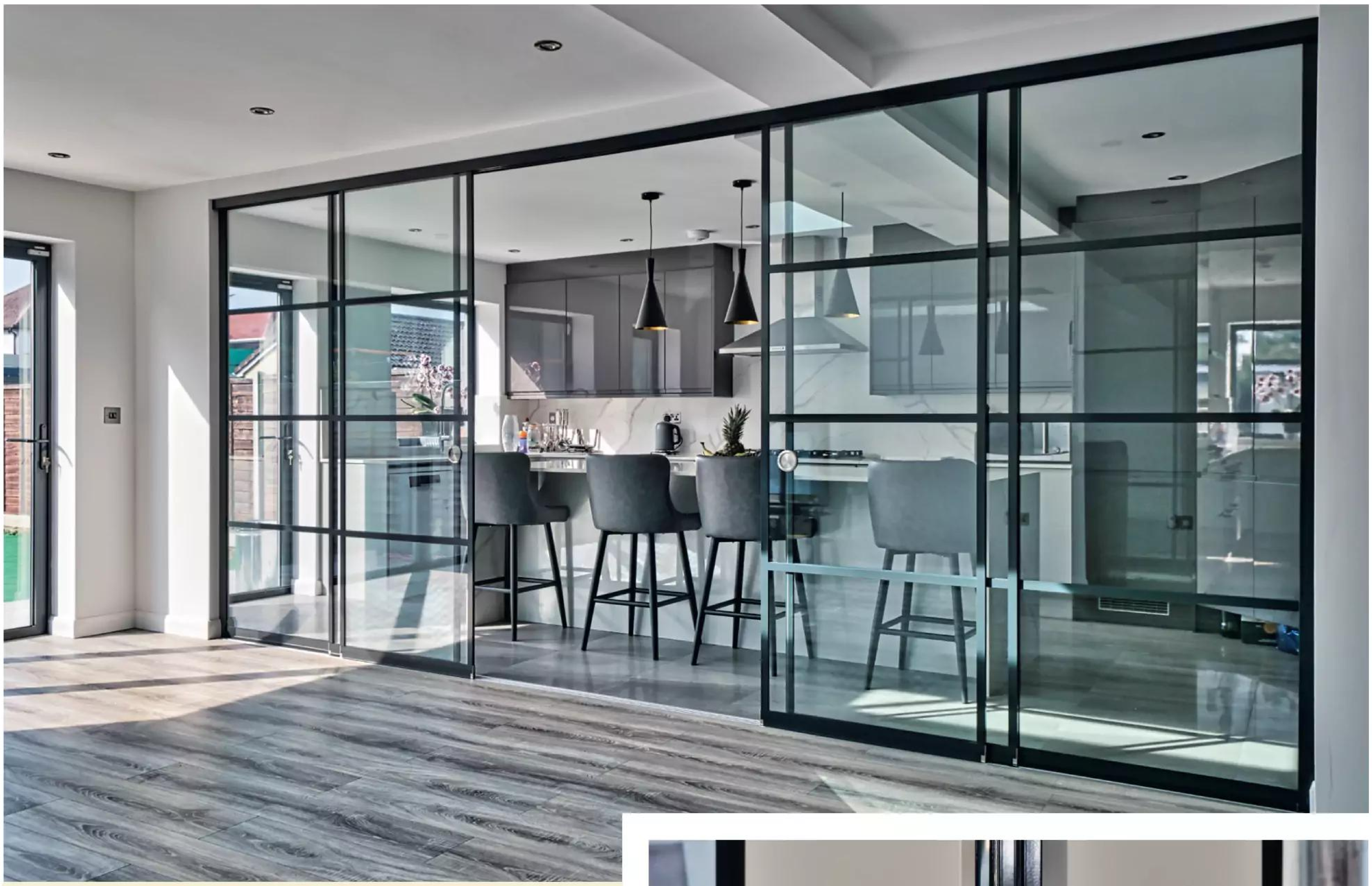
CHOOSING THE RIGHT INTERNAL DOORS

From timber doors to pocket systems, sliders and frameless designs, **Amandine Lefevre** has handpicked a range of internal doors to elevate your design scheme

Internal doors can have a surprisingly strong influence on how a home feels and functions. With so many styles, materials and finishes available, knowing where to start can be a challenge. Whether you're aiming for a sleek, contemporary look or a more classic feel, the first step is to start considering the overall atmosphere you want to create. You'll need to team aesthetics with functionality – fire ratings, light flow, opening style etc.

Your choice of material should also complement the broader design scheme of the space. Wood, for instance, remains a favourite for its timeless appeal and natural warmth, and is available in an array of styles to suit almost any interior. Minimal, clean-lined doors work beautifully in modern spaces, while panelled oak designs are a perfect fit for traditional settings. Glass doors can also look striking and bring a feeling of light and openness to a home.

With such a wide range of designs to choose from, it is important to break down your options. So, we're exploring examples from leading manufacturers, showcasing a variety of styles to help guide your choice.



GLAZED SLIDING DOORS

These single glazed SF22 heritage sliding doors from IDSystems can be a stylish option for dividing open-plan living spaces. With 30mm horizontal bars across the glass, the system takes inspiration from the steel doors of the Art Deco era and offers a cost-effective alternative to traditional forged steel glazed screens. Although open-plan living is often high on the wish list for homeowners, there can be a need to partition up the spaces; hence sliders have become a popular solution for self builds, extensions and home renovations. **(idsystems.co.uk)**

GLAZED POCKET DOORS

Pocket doors combine space-saving functionality with style – allowing you a wide choice of door panels, which disappear seamlessly into the wall cavity when open. Used between living areas, such as a lounge or dining room, glazed versions create a striking visual connection while still providing the option for privacy. Double-door configurations are easily achieved by linking two single systems without the need for specialist kits.

This pocket system by Rocket Door Frames is suitable for three stud wall dimensions, enabling homeowners to pair them with a range of door designs. Even in solid wall applications, a false wall can be installed to accommodate the system without major structural changes. Prices correspond to the pocket system only (and do not include the door panel itself), starting from £390 + VAT with different finishes to choose from. **(rocketdoorframes.co.uk)**

WOOD-EFFECT DOORS

Featuring a ladder-style panel with grooved detailing, the Tigris internal door design from JB Kind features a sleek laminate finish, shown here in a dark grey timber effect. A semi-solid core construction ensures durability and good sound insulation for long-term use and comfort, as well as making it a more budget-friendly solution. Available in a uniform finish, this model is ideal for colour matching, which has become popular in home design. **(jbkind.com)**

EXPERT FAQ GETTING THE DETAILS RIGHT

Elizabeth Assaf is the co-founder of Urban Front. She specialises in designing and curating luxury bespoke doors in diverse styles

Can I mix and match my internal doors to create a more unique look?

The simple answer is yes. Start with those in your hallway – if you have quite a few doors in this area, it often makes sense to match them to either the front door, staircase or flooring. Different doors and finishes for specific areas of the house can work well – and don't be afraid to be bold. If you're keen to invest in high-spec internal doors but can't afford them throughout your property, think about those that will be most visible to guests, such as in the living areas. Also consider matching your closet doors to the walls to help the internal doors stand out.

What is the best way to identify quality ironmongery?

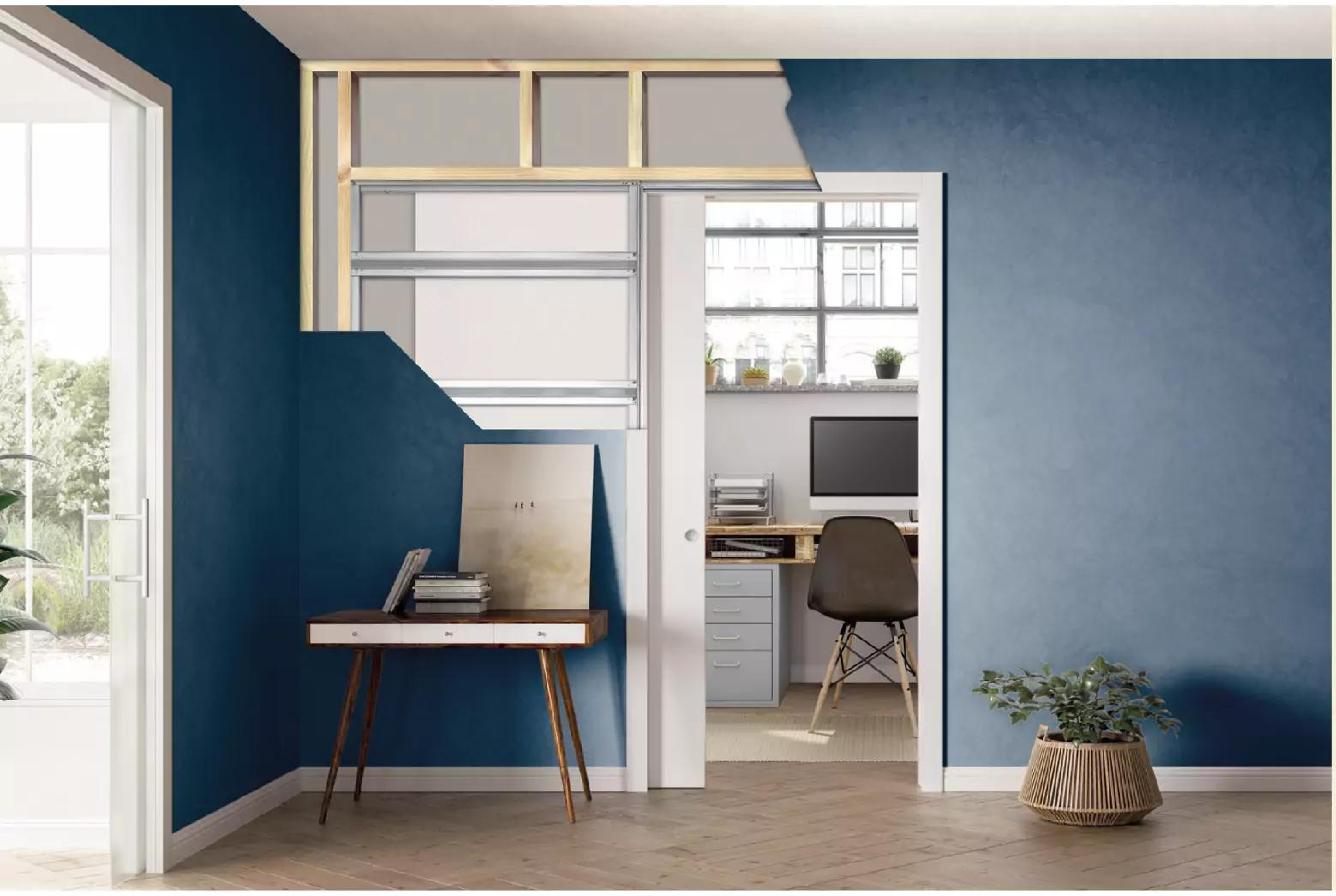
You can usually tell from the price if the ironmongery is good quality, and it's worth spending a little more if your budget allows it. Your choice of material will impact the price, but premium options to look out for include solid bronze, brass or stainless steel. I would recommend looking at the fitting instructions, too, as the installation can elevate or downgrade your choice.

I want a luxury finish – what should I budget for high-end internal doors?

Prices will vary depending on the door's material. Hardwood is a more expensive product than veneer, for example. I would suggest a minimum budget for a high-quality doorset of around £2,000 + VAT. Opting for fire-rated doors will add to the cost, but could be a worthwhile investment. Our internal doors, which can be pivot or hinge, are handcrafted from hardwood, and start at £5,000 + VAT.

Where is the best place to install a pocket door?

Pocket doors are most appropriate when space is at a premium and you don't want a door opening into the room. They usually work best in hallways and small rooms, such as ensuites, studies or utility rooms. As pocket doors slide rather than open, they can also make a useful and practical room divider in open-plan spaces.



POCKET DOORS

In a pocket door, the leaf slides into the wall cavity, as illustrated here in the Eclisse classic single pocket door setup. As well as saving floor space, they are very effective in opening and closing off parts of the home that may require privacy without disrupting the flow of an open-plan layout. In this case, the study is separated from the main living area using a discreet single pocket door system. Eclisse has three styles of pocket door solution. This includes the Classic collection, which requires finishing with architrave (from £249 +VAT for the single pocket door system), and the modern styled Syntesis Flush range – an architrave-free option, offering a minimalistic finish (from £395 +VAT). **(eclisse.co.uk)**

MODERN OAK DOORS

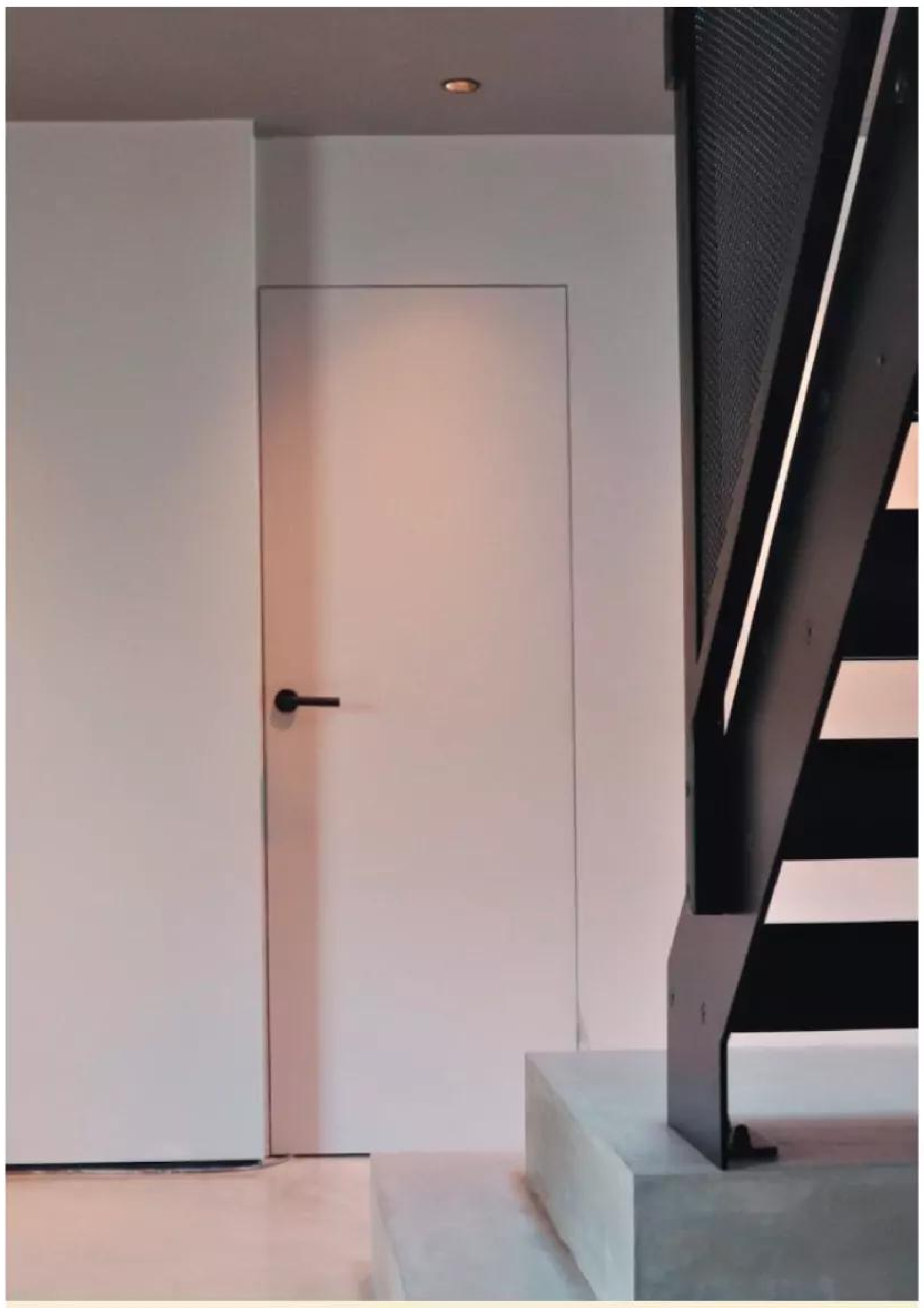
This 1970s bungalow was transformed into a contemporary home with wood cladding throughout and needed the right internal doors to complement its new look. Elizabeth Assaf, co-founder of Urban Front, was looking for full height doors with texture to add depth and character to her interior scheme – and the company's Raw range in European oak fitted the bill perfectly. Soundproofing was also high on her wish list and, with a 54mm panel thickness as well as drop-down seals, these doors significantly reduce noise in the house. Prices start from £5,500 + VAT per doorset. **(urbanfront.com)**

SHAKER-STYLE DOORS

These handmade extra-tall pantry doors from LochAnna's Newbridge collection are crafted in a classic Shaker style – used here to disguise the entrance to a utility zone as well as reduce noise transfer. As a key visual element, kitchen doors provide homeowners the opportunity to showcase creativity and can be specified separately from the other doors as they are a part of a distinct design scheme. LochAnna's pantry doors are available in European white oak and smooth or woodgrain timber, with a wide choice of colours, storage options and frame styles for further personalisation. Kitchens start from £11,510. **(lochanna-kitchens.co.uk)**

GLASS DOORS

Part of the wider renovation of a countryside home, this modern extension is connected to the original property via a frameless glass link for a light-touch architectural feel. IQ Glass supplied frameless and slim framed glazing systems to allow sunshine to flow through the home and connect the interior to the surrounding landscape. Fabricated from toughened glass, the main access door features a matt black bar handle to add a contemporary touch to the characterful interior design. **(iqglassuk.com)**



FIRE-RATED DOORS

Homeowners Pete and Sarah have transformed a neglected 1980s barn into a contemporary home, blending its original rural charm with an industrial aesthetic. The couple specified 14 sleek ultra-flush doors from Rocket Door Frames, which became an integral part of the interior scheme.

Building Regulations require any house with more than two storeys to include a fire-rated door between a habitable room and the stairwell. As this was the case for Pete and Sarah, they opted for a fire-rated ultra flush door leading into their garage from the open-plan layout of the main living space. Each door system undergoes rigorous, independent fire safety testing and is FD30 certified for 30-minute fire protection. They come with an intumescent kit, too, which fits into the frame rather than the door, saving time and cost. **(rocketdoorframes.co.uk)**

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RICHARD CHIVERS

WHAT TO CHOOSE
Extension or conservatory?

These two routes to adding more space to your home each have their pros and cons. **Scarlett Deamer** explores the key factors that could point you towards the right fit for your needs

Transforming your home can take many forms, each bringing its own character and benefits. Choosing between a new extension or a conservatory involves balancing aesthetics, practicality and your budget. Here I'm investigating how these two options differ in design potential, costs and overall performance to help guide your decision.

What's the difference?

Technically speaking, an extension is a permanent structure that forms an integral part of the house and must comply with the full suite of Building Regulations. While it doesn't have to use the same materials as the existing property, it must meet modern performance standards and is usually connected through shared walls, a continuous roof and an open internal layout.

A conservatory, by contrast, is a lightweight structure defined by extensive glazing – typically at least 50% of the walls and 75% of the roof. These structures are often built in PVCu, aluminium or timber. Many conservatories are exempt from full planning and Building Regs if they meet certain criteria, such as being under 30m², are separated from the main house by external doors and aren't connected to the home's main heating system.

So, the clearest distinction between the two is that an extension is a permanent, fully-integrated and regulated part of the building; while a conservatory is largely self-contained and designed to give you a garden room.

From a planning point of view, there's no real difference between building a conservatory and a single storey extension of the same size. "The local planning authorities are generally only interested in the proposed external dimensions of the build, not the materials or design," says Martin Gaine, Build It's planning expert.

Design possibilities

An extension offers considerable design freedom, allowing homeowners to create rooms that blend seamlessly with the rest of the property. "An extension adds vital space to a house that you are able to use all year round," says Simon Graham, director at Yard Architects. With an extension, you have the ability to integrate kitchen spaces, living and entertaining areas or multifunctional rooms into your existing home, essentially giving you a blank canvas for your proposed layout, materials and individual architectural features.

Above left: Designed by Yard Architects, this sleek London extension houses a kitchen diner and sociable seating nook, which overlooks the garden

Above: This charming, timber conservatory by Westbury Garden Rooms has an opening from the kitchen, allowing the beautiful grounds to be enjoyed to the full

Despite its size, this property felt dark and disconnected from the garden. Snell David Architects created a contemporary extension that draws in panoramic views

DAVID VALINSKY

DAVID VALINSKY

Conservatories, meanwhile, provide a different opportunity, focusing on creating a distinct space that's cost-effective to build and connects with the outdoors. "A conservatory makes sense where you want a lightweight, garden-room feel and don't need it as a fully habitable space year-round," says Jim Cattle, director at Snell David Architects. So, there are some practical limitations to bear in mind. "To gain the benefit of not having to comply with full Building Regulations, you won't be able to have other spaces within your house flow into the new conservatory, potentially disrupting free movement across your home," says Opinder Liddar, director at Lapd Architects. However, there are plenty of beautiful conservatories available, from contemporary glazed rooms to more traditional, classic orangeries, letting you add charm and character even within a more separate structure.

Performance variations

When it comes to thermal performance, extensions generally outperform conservatories. "If we were to look at thermal performance, which is typically measured by U-values, the best triple glazed window would have a U-value of 0.7W/m^{2}K, while a floor, wall or roof would perform six times better with a value of around 0.11 to 0.15W/m^{2}K," says Opinder. So, a solidly built extension will retain heat more effectively, reduce energy costs and provide a more comfortable living environment annually. Their insulated walls, roofs and floors make them highly efficient, while their integration with the existing property ensures consistent performance.

Conservatories, on the other hand, can lose significant heat during winter or overheat in summer, increasing energy use. "Opting for an insulated roof with a tiled finish instead of a fully glazed one, can help regulate the internal temperature," says Opinder. They also need more maintenance to ensure optimum performance. "Conservatories need regular upkeep, such as cleaning the glazing, replacing seals and eventually renewing the roof panels or whole glazing units," says Jim.

CASE STUDY

When the owners of a detached home on the edge of Cambridge approached Butcher Bayley Architects (BBA) their goal was simple – to replace a poorly performing conservatory with a bright, welcoming extension that could be used comfortably all year round.

After more than a decade living in their home, the family had a clear design vision. They wanted to create a flexible living area that opened up to the garden and strengthened the home's relationship to the outdoors. The existing conservatory had become unusable – far too hot in the summer and too cold to be used during the winter months – so the owners wanted a practical, long-term solution.

Working closely with BBA, they refined the design to include open-corner glazing and slimline sliding doors from IDSystems' theEDGE2.0 range. The structural design removed the need for any fixed corner posts, allowing the entire space to open out to the garden, bringing in abundant light.

A timber canopy wraps around the rear elevation, incorporating a projecting window seat that creates a lovely spot to sit and enjoy the view. The finished extension now provides a bright, usable living space that connects seamlessly with the garden and patio.

Budget considerations

Conservatories offer an appealing, cost-friendly way to add a bit of extra living space to a property. They are generally much quicker and simpler to build than an extension, allowing homeowners to enhance their home without extensive structural work. "A basic conservatory might range from £1,700-£2,500 per m^2," says Jim. Even on a smaller budget, a well-designed conservatory can provide light-filled charm and practical space.

Extensions are often a more costly build project, but they do deliver long-term value. "A typical single-storey extension built to full Building Regulations might cost £3,000-£4,000 per m^2," says Jim. They tend to be more complex projects, often involving drainage alterations and internal remodelling to ensure they fit seamlessly with the existing house, but will last longer.

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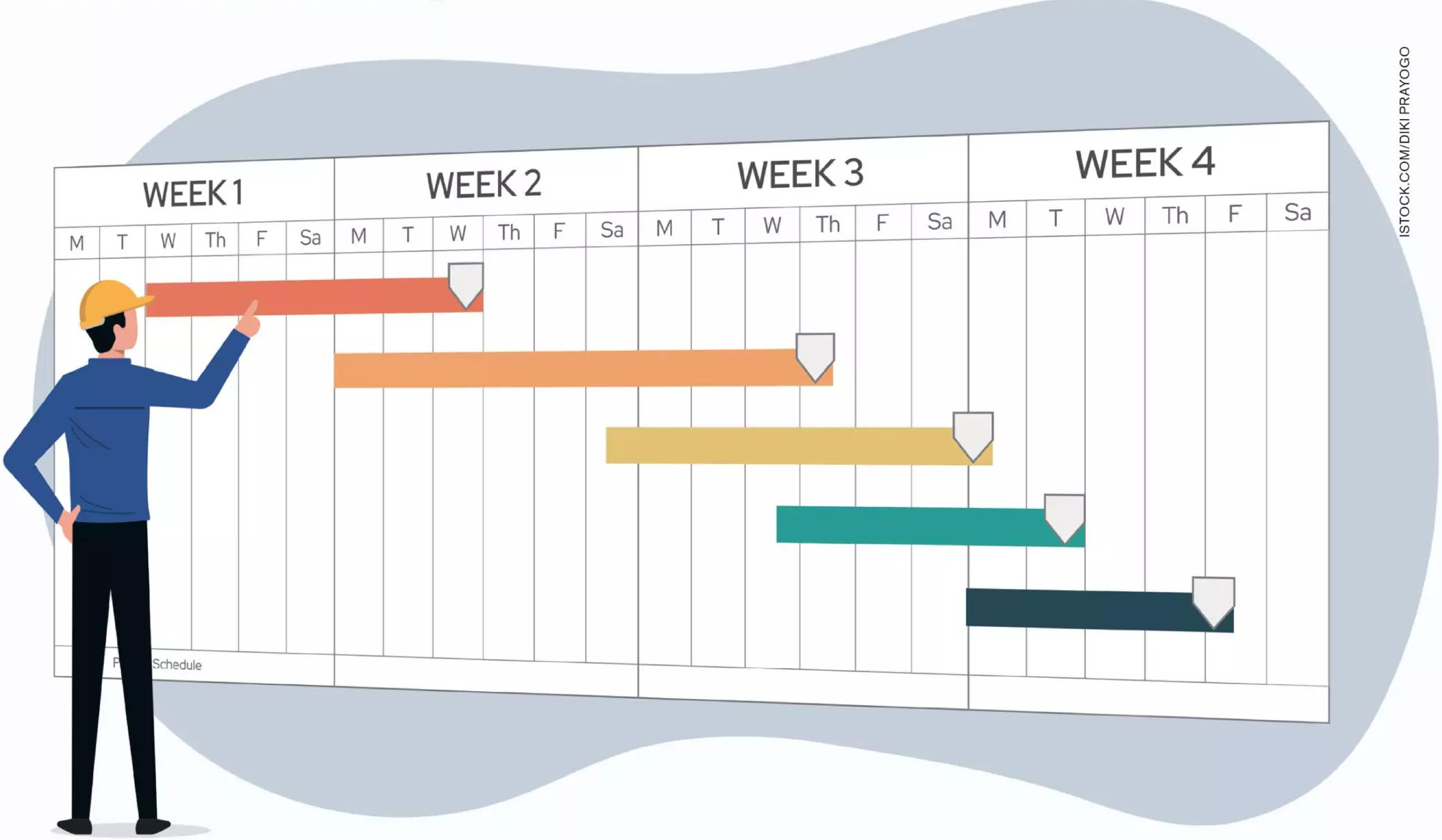
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Planning a great construction timeline

Project manager **Mark Stevenson** sets out what you need to know to develop a self build construction programme you can rely on

One of the biggest reasons that building projects go off the rails isn't because of bad weather, poor workmanship or budget overruns. It's because the timeline wasn't properly thought through in the first place. I've seen it many times – people start with good intentions, a neat Gantt chart and a rough sense of how long things should take. But once construction starts, delays ripple through the programme and, before you know it, a build that was meant to take nine months is still going 18 months later.

As a project manager, I know that an accurate and robust timeline is essential. This isn't just a sequence of dates – it's the backbone of the entire build and how things will get done. It keeps everyone focused, highlights potential problems and orders the chaos that inevitably comes with building a home. So, what's the best way to put one together and, just as importantly, how do you stay on top of it once things get underway?

Start with the end in mind

Every good programme begins with the end date – or at least a realistic target of what's possible. This might be the date you want to move in, the end of a rental term or a fixed completion milestone linked to a finance agreement. Whatever the target date is – provided it's realistic – you can anchor your plan around that.

From there, work backwards. If you need to move in by next Christmas, for instance, and you know your build will take about 12 months on site, you'll need to break ground no later than the previous December. This means that planning permission, design, procurement and pre-start conditions all have to be wrapped up months before that.

Put all that together and, suddenly, a start on site date that felt months away can seem much closer. Working backwards like this brings reality into sharp focus – and it's often the moment self builders realise that getting a project started takes much longer than they expected.

Build in the right level of detail

A common mistake that detail-focused self builders make is trying to plan everything to the hour. At the other extreme, having only a vague idea of the main milestones can prove equally as problematic. The right approach sits somewhere in the middle, with enough detail to manage sequencing and dependencies but enough spare time to accommodate day-to-day issues and minor delays.

I usually start by mapping out the key stages: pre-start activities, substructures, superstructure, enveloping, first fix, finishes and completion. Once those broad phases are in place, I then layer in the specific activities under each one. The key is to capture the logical flow of the build and make sure the sequence makes sense.

Understand the critical path

Every project has a critical path – a sequence of activities that directly determine the project duration. If any of these slip, then the completion date will inevitably be delayed. To some degree, the other tasks will have an element of float or flexibility, meaning they can shift without affecting the overall build duration. Knowing which activities are on the critical path will identify the priorities to focus on.

For example, if there's a delay on external cladding of a timber frame build, plenty of internal work can still progress in parallel – so the build can keep moving without too much impact on the completion date. But if the delay is in the foundations or frame erection, these are critical activities and nothing else can progress until it's resolved.

Factor in lead times & approvals

Timelines often fail not because of the work on site, but because of the things that have not happened before the project got started. Long lead time items, such as bespoke windows, timber frames and other manufactured products, can take weeks or even months to sort out and be delivered. The same goes for discharging of planning conditions, building control and warranty approvals, as well as utility connections. A robust programme considers all of these, and factors in the time needed for them to be sorted in line with the critical path.

Add contingency time (because things will slip)

No matter how well you plan, there will be problems and sometimes delays. Bad weather, material shortages and design changes will all happen. The trick is to allow space for these without blowing the timescales.

I tend to build contingency into each major phase rather than tagging on a lump of extra time at the end of the whole project. By having slack between each stage, there's time to take stock and get ready for the next phase. If you're self-managing, resist the temptation to cram the programme too tightly. A good rule of thumb is to assume everything will take, say, 10% longer than you think. Then, if something does go wrong (and it will), you'll have room to breathe.

Use the right tools (but don't overcomplicate)

You don't need fancy software to put together a good project programme. A well thought-through spreadsheet, or a Gantt chart in something like Microsoft Project or even Excel, is perfectly suitable for a self build. What matters is that it's clear, realistic, regularly updated and shared with everyone who needs it – builders, designers, suppliers etc. Personally, I like to have a single master programme for the overall build supported by simplified shorter programmes for day-to-day use. This ensures that the team knows what's happening without getting bogged down in unnecessary detail.

Keep it live

A build schedule is a living document that needs constant attention to keep it accurate. It's best to check progress regularly and update it when each activity is complete. This will give you a finger on the pulse of the timeline, so if something falls behind, you'll have chance to replan and adjust future activities. The key point is to know where you are – so you don't end up in a position of only realising there's a delay when it's too late to do anything about it.

KEY INGREDIENTS OF A ROBUST BUILD PROGRAMME

ISTOCK.COM/ANILAKKUS

A reliable timeline is built on clear logic, realistic durations and constant maintenance. Keeping the project programme up to date ensures the works can be effectively steered day-by-day. This will help you to spot issues early, keep trades coordinated and, most importantly, finish the build without the chaos and stress that plague so many projects. Here's what to put at the core of your programme:

- Start with a clear project scope.
- Plan the key stages with built-in contingencies.
- Have realistic timescales, with a logical sequence and critical path.
- Secure commitments from all the trades involved in your build.
- Carry out regular monitoring and updates.
- Accommodate wider influences, such as approvals & procurement.
- Clearly communicate via progress meetings, and revise the plan as and when needed.

Communication & accountability

A timeline isn't just for the project manager's benefit – it's a key communication tool. It defines priorities, sets expectations and keeps your build team focused and accountable, especially on milestones and deadlines. Regular progress meetings are crucial to review work, tick off what's done and agree what happens next. It sounds basic, but this routine keeps everyone on the same page and working towards the same goal.

Don't be afraid to replan

At some point, the unexpected will happen, and the original timeline will become inaccurate. At this point, it's best to draw up a new schedule rather than continue with something that no longer makes sense. The key is to treat the programme as a living project management tool, rather than a stick to beat people with.

MARK STEVENSON

Mark Stevenson has worked as a construction professional for over 35 years and is a serial self builder. He runs project management consultancy Elsworth Projects and, as chair of NaCSBA, advocates for the interests of self builders and contributes to the success of the emerging custom build industry.

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DEFINING AN ECO HOME

Energy efficiency and airtightness should come as standard when building from scratch in 2026, so what truly makes a project 'eco'? Here, **Nigel Griffiths** explores the sustainable solutions we should be integrating in our new homes and how you can push things further

Above: Designed by 3s Architects (3s-ad.com) and achieving an impressive SAP rating of 96, Poppyfield House combines a highly-insulated and airtight building envelope with a heat pump, underfloor heating and solar panels for modern, low-energy living

The term eco home means different things to different people. Some will want a house built with natural materials and an organic garden. Others look to install all the latest gadgets and power their home with systems like a solar PV array and battery storage. So, the starting question for any eco project is what, exactly, are you trying to achieve?

You might be shocked at my first piece of advice, which is don't get hooked on energy and carbon. Creating a truly sustainable home is about much more than this. Typically, these are the key areas you'll want to consider:

- **Health & wellbeing**
- **Low-impact materials**
- **Energy efficiency**
- **Water efficiency**
- **Sustainable drainage**
- **Ecological outside space**

In each case, it's important to take care when it comes to the use of metrics. A product designed to deliver low energy in use might involve expending a huge amount of energy to manufacture. This embodied impact is often ignored. It might also generate pollution or use up finite resources. It can be difficult to unlock the wider impact of what, on the face of things, feels like a sustainable choice.

Healthy homes

Building a house is first and foremost about the people who inhabit it. So, always begin with health and wellbeing when making decisions on your project. A good starting point is to avoid materials that give off toxic fumes, such as volatile organic compounds (VOCs).

Whatever eco standard you're building to, be sure the property benefits from plenty of fresh air, so it can get rid of pollutants quickly. There's no point hermetically sealing your house in the name of energy efficiency and then having to live with poor indoor air quality because there's insufficient ventilation (see page 78 for more).

Creating a healthy environment isn't just about avoiding pollution. Mental health is just as important – our homes are where we spend the majority of our lives, and for those of us who work from them, potentially nearly all our time. So, if you're building new, aim to maximise ceiling heights and natural daylight. There's good evidence that this makes a positive contribution to mental health.

Don't forget the importance of outdoor space in terms of living a healthy lifestyle, both mentally and physically. Anyone who grows even just a few herbs and vegetables will tell you how beneficial this is to them.

Low-impact materials

The biggest environmental impact from building a new home comes not from the eventual running of it, but from the construction process. For many of you, this will be the largest single project of your lives. It's a good idea to focus on the materials that go into the structural fabric and do what you can to deliver positive results for your lifestyle, health and the environment.

There are some very low-impact construction methods – such as straw bale, cob and hemp – but these aren't for everyone. But, there is of course a middle ground between this and eco-bling. A low-impact home, with low embodied energy and carbon, can still be achieved by making tweaks to standard build processes and materials. For example, many self builders will opt for timber frame, as it is inherently sustainable and allows for maximum choice of sustainable insulation materials. Timber also locks up CO2 in a building (as carbohydrate). So, with careful specification, it may even be possible to create a building that's carbon-negative in construction.

People who wish to build sustainably prefer natural materials, and tend to avoid plastics. We didn't have this product until the 20th century and managed perfectly well without it for thousands of years. So, think carefully before saving a few pounds by putting in PVCu windows. Insulation is another big-ticket item. There are plenty of low-impact insulation materials available, ranging from wood fibre to mineral wool. Certainly, there's no need to use oil-derived plastics if you don't want to.

The same approach goes all the way through the build, from foundations to floor coverings, from the roof to the kitchen and the type of paint you choose. Minimise pollution, maximise your use of natural and renewable materials. For more on material choices for your eco home, head over to page 88 of this special section.

Building fabric & reducing heat loss

In recent years, changes to the Building Regulations mean that all new homes are now very well insulated, so the need for space heating has fallen dramatically. Depending on the site, it is now possible to eliminate the demand for central heating (and cooling) almost completely by using a fabric-first approach and passive solar design. Note that this isn't the same as Passivhaus design, which is a specific building standard that uses passive solar design alongside other efficiency measures such as airtightness and heat recovery ventilation.

Passive solar design is all about taking advantage of a free natural resource – the sun – to reduce your home's energy demand. With the right steps, you can significantly reduce the need for heating and artificial lighting in your new home – while also avoiding the risk of overheating. There are six key aspects to create effective passive solar design:

Orientation If your site has a good southern aspect, then position the house to face south in order to maximise how much solar gain comes into the building.

Fenestration Large windows on the southern elevation will allow the heat of the sun to penetrate into the core of the building, while reducing fenestration on the northern elevation will minimise heat losses.

Superinsulation Unless space is constrained, it is possible to go beyond the Building Regulations and achieve even lower U-values (a measure of heat loss, where lower numbers indicate better performance) then are currently required, at very little extra cost.

Airtightness Again, the Building Regs now require good levels of airtightness but, in a super-insulated home, air leakage may become the major source of heat loss. So, airtightness becomes critical if you want to achieve certain standards or use a heat recovery system.

Thermal mass It is essential to build in plenty of thermal mass. This

Above: A natural materials palette was chosen for this Baufritz (baufritz.com) home, which uses a timber frame setup featuring organic wood-shaving insulation. The house enjoys beautiful daylight through picture windows along with double-height ceilings, enhancing mood and wellbeing

Left: Natural and non-toxic, Clayworks (clay-works.com) clay plaster adds a warm, textural and through-coloured finish for walls

Above: Rainwater harvesting is relatively easy and affordable to integrate into a new build house; particularly if you excavate for the tank at the groundworks stage. Shown here is a shallow-dig tank design from Rainwater Harvesting (www.rainwaterharvesting.co.uk), which requires less excavation and is suitable for sites with a high water table

is usually done with dense materials (such as concrete blocks) that can absorb the heat of the sun during the day and radiate it back out at night. The building therefore becomes a giant storage heater. This is also important to help prevent rooms from overheating.

Solar shading Overheating is a significant risk in passive solar design, so effective shading is required to filter out excess sunlight when the sun is high in the summer, while also allowing it to enter when the sun is low in the cooler months. This could be achieved by natural means (eg trees) or with built-in components such as roof overhangs and brises soleil.

Even if your site doesn't have a good southern aspect, it is still possible to achieve very low space heating demand by super-insulating the building and aiming for the highest standards of airtightness. Go to page 68 to learn more about how to create an efficient thermal envelope.

Heating & hot water

There has been huge focus on how we provide our space heating, given the move away from fossil fuels towards electrification of heat. Really, this focus should be shifted to existing buildings rather than new ones, because if you're building a home with very low heat demand, it frankly makes little difference how you heat it.

To meet that residual demand, new builders are of course encouraged to use heat pumps and these will certainly be lower carbon in use than gas boilers, thanks to the rapid decarbonisation of the electricity grid.

LANDSCAPING

Mainstream developers leave the outside space until last, by which time the topsoil has often been degraded and sometimes polluted. Self builders, on the other hand, have the freedom to start with the garden, protecting existing assets/features and planting trees and bushes early.

Growing vegetables and keeping a few chickens might sound like The Good Life, but it's called that for a reason. Building a beautiful garden also gives you more options to relax and entertain, whilst supporting a wide range of birds, mammals, insects and even amphibians. Perhaps this, above all else, will help to develop your approach to becoming a great eco self builder. And don't forget to incorporate a compost heap in your plans!

Perhaps more importantly, while our need for space heating has fallen, so the demand for hot water has risen (we take more baths and showers than we used to). This means domestic hot water (DHW) now has a greater impact than space heating in many new dwellings. So, use it efficiently and perhaps install solar water heating, which should cover around 50% of your hot water needs.

Solar water heaters simply transfer heat directly from the roof collector into the hot water cylinder. This is not the same as solar photovoltaic (PV) panels, which make electricity from light and have now become widespread across the roofs of homes. Confusingly, however, you can use excess PV-generated electricity to heat your hot water through an immersion heater.

Setting PV aside for a moment, it would normally be more efficient (and cheaper) to provide hot water using your heat pump rather than an electric immersion heater. While an air source heat pump will be slightly less efficient at supplying hot water than it is for space heating, it should still deliver at least two units of heat for DHW purposes for each unit of electricity input.

On page 78 of this special section we're exploring heating, ventilation and comfort, while on page 82 we're looking into renewable power options.

Water use

Despite all the focus on energy use and CO2 emissions, it's worth bearing in mind human settlement can only continue where there is an adequate supply of potable water (that which we use for drinking and washing). In some areas of the UK, this supply is under pressure.

Low flush WCs are now mandatory, and low-flow taps and showers can also help to keep down potable water use. But there are much more significant water savings available through rainwater harvesting. These systems collect rainfall from the roof and store it in tanks for use in WC flushing, washing machines and outdoors (garden irrigation, car washing etc). As WC flushing is often the biggest culprit for water usage, you'll make handy savings in running costs with rainwater harvesting.

Sustainable drainage

Heavy rainfall is more common these days and rainwater that used to soak into fields, gardens and lawns now falls on car parks, drives, roads, roofs and patios. From here, it is channelled directly to the drainage system, sometimes causing flooding downstream. Sustainable drainage systems (SuDS) have three main aims:

- **To reduce flooding by delaying the discharge of rainwater.**
- **To enhance water quality.**
- **To improve the environment and provide habitats for wildlife.**

While larger developments are already required to have a SuDS strategy in place, self builders can adopt the same principles and do what they can to reduce flood risk and - if possible - to enhance ecology.

Go to page 85 in this eco home special to read more about sustainable water and drainage in your project.

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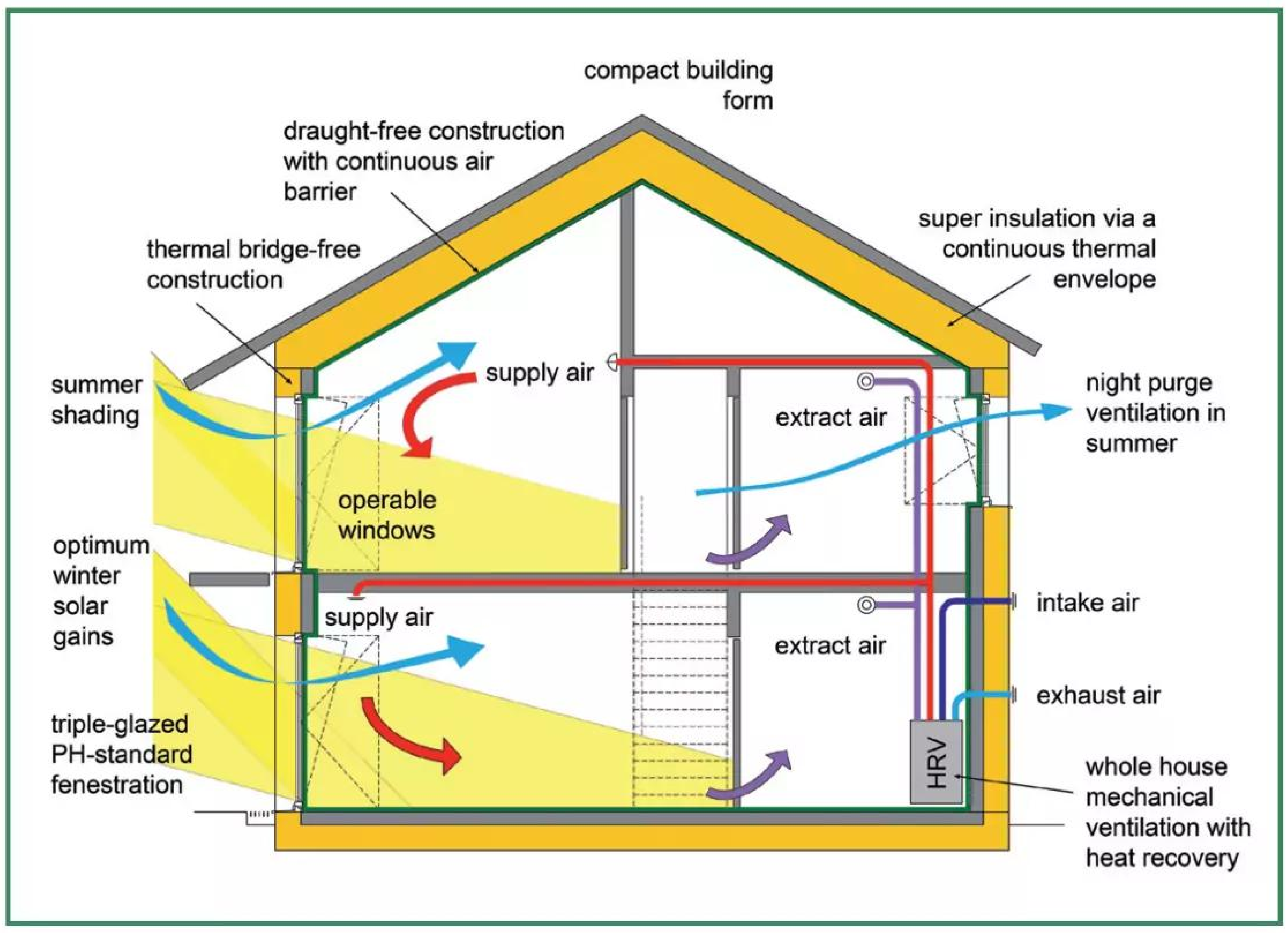
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Above: This illustration from the Passivhaus Trust demonstrates the key principles of the low-energy building standard, including super-insulation and a continuous airtightness barrier

One of the keys to realising a low-energy self build is focusing on the thermal envelope – the insulating shell that controls heat, air and moisture movement between indoors and out. It comprises the walls, roof, floor, windows and doors. A well-designed envelope will reduce heat loss, slash bills and cut carbon emissions, but it's about more than just packing in insulation. Factors such as airtightness, thermal bridging and thermal mass all play crucial roles in achieving comfort, efficiency and durability.

Where to start

The house shell is critical, but before you expend too much energy worrying about how to get it right, it's worth knowing that simply working to Building Regulations will already put you on the path to a pretty efficient home. The 2022 updates to Part L tightened rules on fabric performance, airtightness and thermal bridging – helping new homes cut carbon emissions by around 30%. The Future Homes Standard, expected from 2027, will push standards further, though we're not expecting a revolution on U-values or airtightness.

So, there's scope to go beyond the basics. Many self builders aim for homes with consistent comfort, excellent air quality and very low running costs. How far you go depends on your budget and ambitions. For instance, you could aim for the Passivhaus standard, which sets strict limits on airtightness (under 0.6 air changes per hour at 50 Pascals) and heating/cooling demand (both of which must be under 15 kilowatt-hours per m^2 per year). As a rough guide, working to Passivhaus can add around 8% to your build costs, but it will deliver long-term savings once you're in your new home.

The secret is to engage good, experienced people on your project – from design team through to suppliers, contractors and installers. Building a high-performance house shell isn't rocket science, but it depends on good planning and effective implementation.

Ask for quality construction drawings that zoom in on the air barrier and thermal bridge detailing at junctions and penetrations, so the as-designed performance can be followed through on site. And be sure to onboard other key parties at the technical design stage, so they can help your design team achieve best results and simplify the process. "When you buy our windows, for instance, we offer the option of a Passivhaus package that includes all the tapes and seals you'll need for an airtight install," says Alex Alsopp, director at Norrsken.

MORE SUSTAINABLE BUILDING STANDARDS

Living Building Challenge: Aims for homes that nurture both people and place, focusing on light, air, food, nature, community and self-sufficiency (within the site's limitations).
Passivhaus Plus: Bolts renewables onto the popular Passivhaus standard, requiring buildings to also generate as much energy as they consume each year.
Passivhaus Premium: The building must be a net-positive energy producer.
Well Standard: Places significant import on occupant health and wellbeing through improving indoor air quality.

Insulation & thermal bridging

Insulation is at the heart of the thermal envelope and, as a self builder, you have the benefit of a blank canvas. "To achieve modern thermal and acoustic requirements, the right insulation must be correctly installed in the walls, floors and roof," says Nigel Griffiths, Build It's sustainability expert. For example, floor slab insulation needs sufficient compressive strength.

Your house designer will coordinate the materials specification, based on your brief, performance goals and other preferences. The best results come from collaboration between them and your structural system supplier – especially where the latter is responsible for the engineering design and overall fabric performance.

Good detailing is key. The way insulation interfaces at junctions with windows, doors, roofs and floors must

Right: Oakwrights' WrightWall Natural system – which provides the insulating, airtight encapsulating wrap for its oak frames – is now available with Steico Zell air-blown wood fibre insulation be carefully designed to avoid thermal bridges, which are essentially weak points where heat can leech out. In response to the 2022 Building Regs updates, many structural system suppliers have developed robust details aimed at designing-out thermal bridging. It's also now common to incorporate an extra layer of continuous internal or external insulation. You can also opt for a package that includes the insulated foundations, walling system, roof and windows/doors, giving them full control over how the house shell performs.

Beyond pure insulating qualities, you may also wish to consider factors such as embodied carbon, natural or recycled materials, and how thick the wall or roof profile needs to be to reach the target U-values. For instance, recycled cellulose insulation offers good thermal performance and breathability, whereas rigid plastic insulation boards are higher-carbon but achieve low U-values in slimmer profiles. Insulation can also keep your home cooler in summer by slowing heat transfer. High-density natural materials, such as wood fibre, have a useful decrement delay, helping to buffer temperature swings and maintain a more even heating/cooling cycle.

More online: self-build.co.uk/insulation-options

Airtightness

When air leaks out of a building, heat escapes with it and draughts can form. So, sealing up the thermal envelope is a vital step. It can also be more cost-effective than simply adding ever-more insulation. Building Regs still allow up to $5m^3/hr/m^2$ of air leakage, a relatively loose target, and the Future Homes Standard is only expected to marginally improve on this. For context, at Build It's Self Build Education House, we hit $1.6m^3/hr/m^2$ – and our contractor was learning as they went!

QUICK GUIDE CONSTRUCTION METHODS

Prefabricated timber systems such as panelised timber frame, SIPs (structural insulated panels) and encapsulated oak all share similar eco benefits. Specialist engineering and factory manufacture ensure a comprehensive package of insulation, airtightness and thermal bridge detailing – with the supplier's own team often erecting the shell, giving confidence you'll get what you specified. This minimises the performance gap between design and what's actually built. Using responsibly sourced timber reduces embodied carbon, while systems such as timber frame and encapsulated oak offer you choice over the insulation material, including natural options.

ICF (insulated concrete formwork) combines permanent insulating formwork – in varying thicknesses to best suit your performance goals – with a concrete fill. Properly installed, the poured concrete is effectively airtight, giving you a high-performance house shell out of the box. While the system can be high in embodied carbon, some manufacturers are addressing this (check out the R-Wall case study on page 71).

Blockwork can deliver for low-energy homes, as 21 Degrees has demonstrated with multiple cavity wall Passivhauses. Walls need to be thick to accommodate the required insulation, while airtightness and thermal bridge detailing depend on good site practice – well within the scope of conscientious builders. Standard blockwork is leaky, but thin-joint systems (which use an adhesive rather than mortar) can reduce this. A wet plaster finish provides the final airtight barrier and has the advantage of being repairable in future. New innovations are also addressing embodied carbon – see page 98 for more.

Again, a lot comes down to good detailed design. "On the drawings, you should be able to draw a continuous air barrier line around the external skin, without taking your pen off the paper," says Hugh Franklin from Aeroseal. Appointing experienced trades is equally important. Look for people familiar with building to the performance levels you want and the systems you're using. Lean on your designer and key suppliers to recommend compatible tapes and membranes that suit your chosen construction system, and advice on how they're best installed.

More online: www.self-build.co.uk/airtightness

Above: The Aeroseal system pressurises a building at first fix stage, so a waterborne, vapour-permeable airtightness seal can seek out and plug leakage points – with live control and monitoring to achieve the desired performance level

Thermal mass

One way to visualise how thermal mass works is as a battery – storing heat and releasing it later. "If the rate is controlled and accounted for in the design, it will make the house more comfortable and reduce heat demand," says architect and Build It expert Julian Owen.

Materials such as brick, stone and concrete are great at this; more lightweight materials like wood less so. But even timber frame houses can benefit from thermal mass. "Most of the heat is stored in the first 50mm of a product's thicknesses," says Julian. "So, incorporating features such as stone floors and internal lime or clay plasters will make a notable difference."

To make best use of the effect, the insulation should sit outside the heat-absorbing materials – leaving all that mass available inside the house. Team this with good passive solar design (orientation in relation to the sun) to maximise free heat gains in the colder months and reduce overheating risk in summer.

More online: self-build.co.uk/thermal-mass

CONTACTS **21 Degrees** 080 8281 5021 www.21degrees.com **Aeroseal** 01432 513499 www.aeroseal.co.uk **Beco Wallform** 01652 653844 www.becowallform.co.uk **Frame Technologies** 01544 267124 www.frametechnologies.co.uk **MBC Timber Frame** 01452 346499 www.mbctimberframe.co.uk **Norrsken** 01202 632777 www.norrsken.co.uk **Oakwrights** 01432 353353 www.oakwrights.co.uk **Passivhaus Trust** www.passivhaustrust.org.uk **Path-50** 020 8189 5760 www.path-50.co.uk **PYC Group** 01938 500797 www.pycgroup.co.uk **R-Wall** 01288 377337 www.r-wall.co.uk

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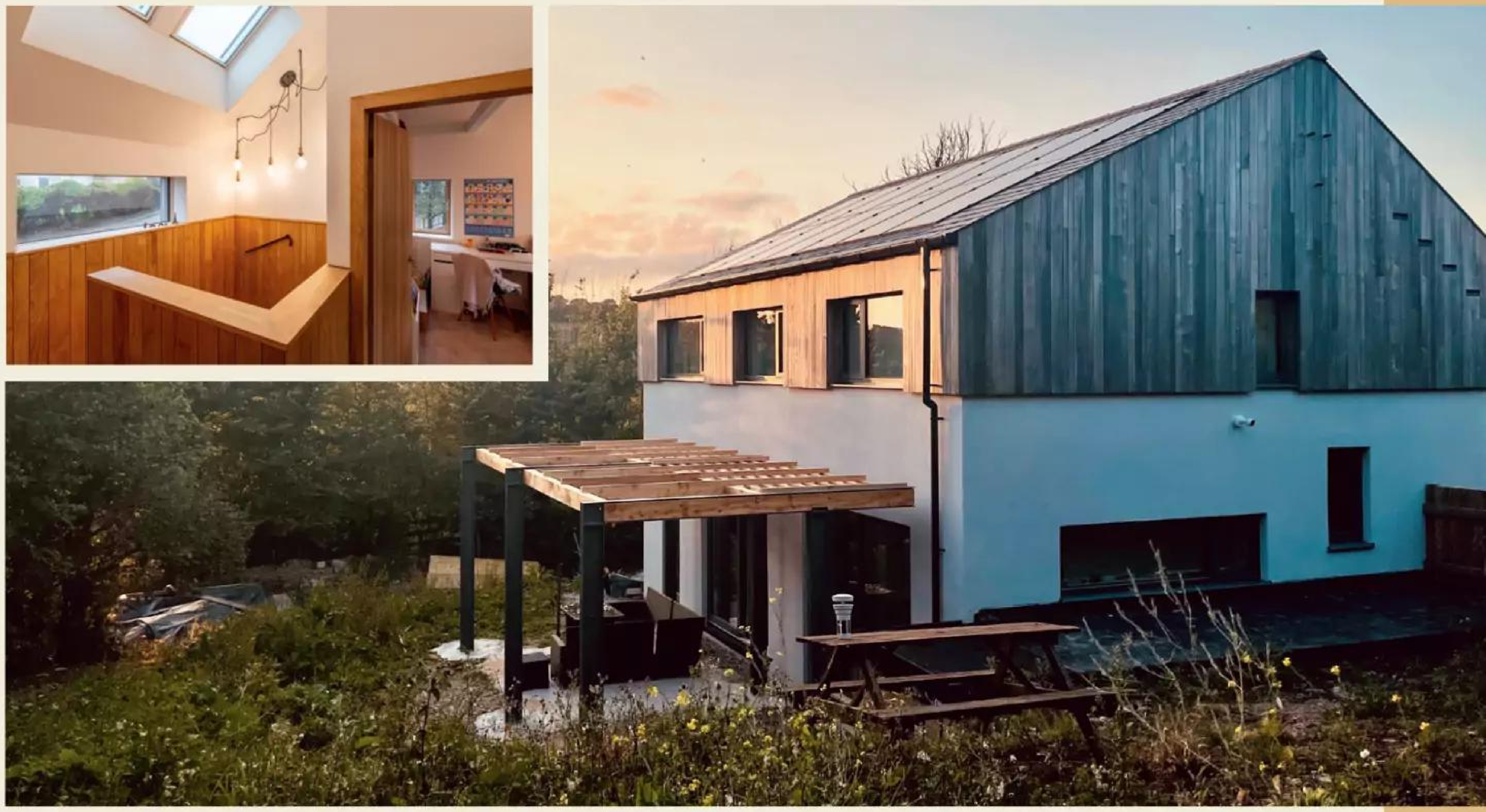
Future-ready eco build

Explore the Stewarts' low-energy, low-impact home – constructed with R-Wall ICF



When Dan Stewart and his family set out on their self build journey, from the very outset their key goal was to create a low-energy, sustainable yet modest forever home. An architect by trade, Dan's design for the three-bedroom property – named Birdsong – was developed to tread lightly on its plot, which is set in a designated national landscape. But this isn't a wow house on a grand scale, rather a statement of what's possible for self builders who want to be environmentally conscious while working to an everyday budget.

Efficient design

Guided by Passivhaus design principles, the Stewarts' highly-insulated and airtight home requires only a very small amount of space heating (just 11 kWh/m²/yr). This is satisfied by an air source heat pump (ASHP) hooked up to towel rails in the bathroom and ensuite. In addition, a water battery coil pre-warms the incoming air supply from the whole-house mechanical ventilation and heat recovery (MVHR) system – contributing to a stable, healthy internal environment. "The air quality from the ventilation system is fantastic," says Dan.

The upper storey of the house is vaulted to provide two floors of accommodation while keeping the ridge height low. An asymmetric roof adds visual interest, with the largest of the pitches – which faces just off-south – hosting integrated solar photovoltaic (PV) panels hooked up to a battery. Excess power is sent to the grid or to charge the family's electric cars.

Going local

The Stewarts were keen to address their project's wider environmental impact. "We were passionate about using local suppliers where possible," says Dan. To that end, the external cladding, internal panelling and timber used for the solar shading were all sourced from local sawmills that source from British woodlands. Main contractor Avocado Construction is based just down the road, reducing transport miles, while structural system is from Cornish company R-Wall, which manufactures its insulating concrete formwork (ICF) in the UK.

R-Wall's ICF system features two layers of rigid XPS insulation with a gap in-between, into which concrete is poured on site to create a super-strong structure that delivers excellent long-term performance.

FACT FILE

Project type	Self build
Location	Devon
House size	96m²
Build cost	£398,000
SAP Rating	111 (A)
Airtightness	0.37m³/hr/m²
Accreditations	AECB CarbonLite
Designer	ALA Architecture
Structural system	R-Wall ICF

Manufacture of the XPS uses waste CO2 as a blowing agent, reducing embodied carbon, while the factory runs on wind energy. The plastic rails and ties that hold the XPS together are made from 93% recycled plastic window frames, while the concrete for this project incorporates Regen and secondary aggregates from the local china clay industry. These innovations represent a dramatic reduction in embodied carbon compared to standard ICF solutions.

Low-energy living

Since moving in, the Stewarts have been delighted with their new home. "There are aspects of living in Birdsong I hadn't anticipated as a designer," says Dan. "This includes how comfortable and stable the internal temperature is throughout the year." Indeed, the combination of a highly efficient building fabric and renewable technologies meant the first year's bill for this efficient, all-electric house came to a remarkable -£25; so it generates more energy than it uses.

On completion, the house's Standard Assessment Procedure (SAP) rating was calculated at 111 (A) for energy efficiency and 103 (A) for environmental impact, with CO2 emissions expected to be -2.85kgCO2/m². In December 2024, the house was certified to the AECB CarbonLite New Build Standard.

Ecology was another key element in boosting Birdsong's sustainable credentials. Rather than sticking to the base planning requirement for a 10% biodiversity net gain, the Stewarts achieved a 48% boost with measures such as the inclusion of bat roosts, bird boxes, new trees and hedgerow.

CONTACTS

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ALA Architecture 01548 853699
www.ala-architecture.co.uk

Windows & doors for new eco homes

Above: English Brothers (englishbrothers.co.uk) provided the timber frame for this stunning new home in Cambridgeshire, which features cantilevered volumes that shelter the glazing below and recessed balconies on upper floors

Right: Brise soleil positioned above Internorm's (internorm.com) triple-glazed HS 330 timber-aluminium lift-and-slide door offer shading to stop overheating

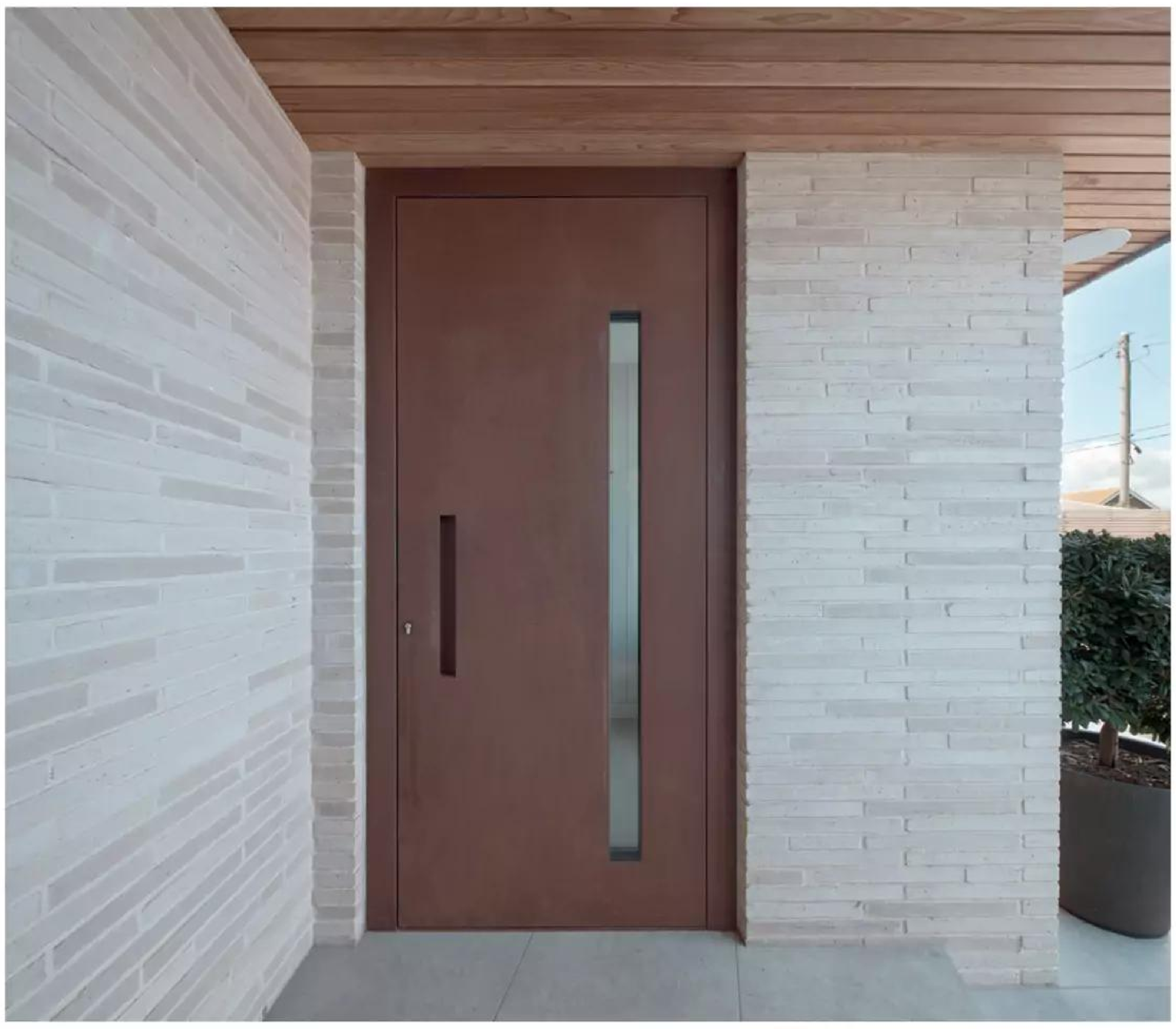
Fenestration has an important role to play in your house, both in terms of style and energy efficiency. **Emily Batesmith** investigates how to get it right

Doors and windows are essential parts of your property, allowing access, daylight, ventilation and views. Plus, large spans of glazing are are a great way to create stunning architectural features, framing eyecatching scenery and helping to connect interiors with natural surroundings. And as a major player in your property's external skin, they have an important job to do if you're creating an eco home.

Self building an ultra efficient home probably means that you're hoping not to depend heavily on heating, so you need your house to have a solid thermal barrier. The issue is that glazing will never be as much of a thermal barrier as an insulated wall system. Plus, it actively encourages sunlight (and therefore heat) in – useful at some times of the year, not so much in others.

Get it wrong, and your lovely glazing that's offering those great views will leak precious warmth out during cold months or allow too much heat inside during hot weather. The same is true with doors, where draughts can get in around the seals, letter boxes and suchlike. And while glazing and openable elements of your home

Above: This modern new homes in Surrey by Duncan Foster Architects (duncanfoster architects.co.uk) includes theEdge 2.0 sliding doors by IDSystems (idsystems.co.uk), an ultra-slim design that picked up the Build It Award 2021 for Best Glazed Doors



Left: Urban Front's (urbanfront.com) Terano Corten is a steel front door with insulating woodfibre core and concealed handle. It's available in a pivot or hinged design. Note that pivot doors are generally less airtight than side-hung versions

will never be as energy efficient as a solid wall, there's lots you can do to make sure your fenestration helps to maintain the comfort levels you want in your home.

Energy performance

A product's U-values will tell you how efficient they are – the lower the number, the more efficient. Windows in new homes must have a U-value of 1.2 W/m^{2}K and doors 1.0 W/m^{2}K to meet Part L of the current Building Regulations. But you'll want to aim for better than that if you're looking to create a highly efficient structure. Passivhaus design, for instance, requires windows to have a U-value below 0.8W/m^{2}K.

Make sure you're looking at the performance of the whole unit, including the glass and frame; not just the pane. Plus, good installation is crucial, as a badly fitted window or door will perform poorly even if you've invested in the most highly efficient product available (learn more about the thermal envelope on page 68).

Having three panes of glass, ie triple glazing, instead of two will reduce heat transfer through your windows. "The gaps between the panes can be filled with air or – more usually – a super-insulating inert gas, such as argon or krypton, to maximise performance," says Thomas Hagen, technical manager at Internorm. "As a guide, double glazed units typically achieve a U-value of around 1.4 W/m^{2}K, whereas a modern insulated wall would hit 0.2 W/m^{2}K or better. Triple glazed windows and doors bridge the gap between the two."

That said, good quality double glazing can still be the right choice for some projects or potentially for specific locations within your building. Many suppliers can offer both solutions, which may give you flexibility on specification and cost.

Combatting overheating

Having sunlight pour into your home through large spans of glass can be great, especially when you can utilise that natural warmth to heat rooms in colder months. But too much solar gain in the summer can leave rooms feeling like a sauna. This is such a recognised issue that there is now a section in the Building Regulations that specifically acts to combat overheating in new homes.

"Part O is an incredibly important part of the Regs to take into account when considering architectural glazing," says Edward Stobart, sales manager at IDSystems. "It currently only applies to new-build homes and places the most stringent restrictions on south-facing elevations in areas deemed to be most at high risk, such as London. If this applies to you,

DOUG WILDERS

Above: This Passivhaus project features a range of alu-clad timber glazing systems from Norrksen (norrsken.co.uk), including this arrangement of full-height fixed glazing incorporating a P31A top-hung, outward-opening window. The system can achieve whole-window U-values of around 0.75 W/m^2K

then understanding what can be achieved to mitigate overheating is crucial from the first stages of design."

The orientation of glazing is crucial here. North-facing windows will be exposed to less sun, so windows can be larger without too much concern for rooms getting overly hot. Southern-facing glass will get that brilliant free heating from the sun in the winter when you need it, which is known as passive solar heating, but you'll need strategies in place to stop rooms from overheating.

Mechanical ventilation or even air conditioning can help homeowners to deal with rooms becoming too hot, but it's best to reduce the risk of overheating happening in the first place by creating barriers in the design. Shading options can include mature deciduous trees (providing cover when in leaf), louvred brise soleils fitted above windows and overhanging roofs. The glass itself can also be treated with solar control coatings.

Environmental impact

"In terms of the energy and carbon that goes into building a house, windows might constitute 20% or more of the total embodied environmental impact," says Nigel Griffiths, Build It's eco expert. This means it's important to carefully consider the materials that your fenestration is made from in order to keep the carbon footprint of your project as low as possible.

EMBODIED CARBON OF MATERIALS

Material	Embodied carbon per kg (kg CO2e/kg)	Embodied carbon per linear m (kg CO2e/kg)
TIMBER (SOFTWOOD)	0.5	-2.5-1.5
PVCU	2.4	40-60
ALU-CLAD TIMBER	5.0	80-150
STEEL	1.4	140-200
ALUMINIUM	8.2	320-500

UNDERSTANDING ENERGY EFFICIENCY TERMINOLOGY

It's crucial to choose doors and windows that offer great performance, as well as style. Here's an explainer for the jargon you might read on product descriptions:

U-value: A calculation of heat loss through the materials making up the unit, measured in the number of Watts per m^2 per degree of temperature difference one side and the other (W/m^2K). Lower figures indicate better performance.

Ug-value: Heat loss calculated through the glass.

Uw-value: Quantifying a whole glazed unit's heat loss, including the frame.

Low-e coatings: These help to reduce heat loss through glass without impacting on the passage of visible light.

Gas fills: Typically argon and krypton fillings between panes, which can minimise heat transfer.

Laminate glass: Adds a greater level of security and protection from intruders.

Triple glazing: Three panes of glass in a window or glazed door (rather than the standard two) increases performance.

Energy rating: Performance indicators from A++ (rated as excellent) to E (low) are provided by The British Fenestration Rating Council, who assess the frame and glass, analysing heat loss and solar gain.

Certified Passivhaus Component: These products have been tested and verified by the Passivhaus Institute as meeting the standard's high energy performance criteria.

"One metric that we can be reasonably sure about is a material's embodied carbon, which is the CO2 emitted to extract and process raw materials, then turn them into building products," adds Nigel, who provided the figures in the box below. "Timber has by far the lowest impact in terms of embodied energy/carbon. The values for aluminium depend heavily on whether it's made from primary (virgin bauxite) or secondary (recycled scrap) sources. Virgin is 11-16kg CO2e/kg, whereas recycled is less than 1.0. In the UK and Europe, the average recycled content within aluminium is 30%-50% (hence the indicative value used here of 8.2)." Aluminium is also infinitely recyclable at end-of-life.

Style & longevity

The efficiency or embodied carbon of a product isn't going to be your only draw – regardless of how far your eco ambitions reach. Style and appropriateness for your house's design should be the first tick box. Get it right and you'll have doors and windows that add to kerb appeal, resulting in a house that will stand the test of time, hopefully surviving long enough to work some way towards offsetting the carbon footprint from building it.

With this in mind, you're looking to invest in high quality systems with good seals and robust hinges. Timber units that are properly maintained can last forever, while some products have an expected lifespan, for instance, PVCu windows will last around 25 years. "Note that sliding and bifold doors typically offer better longevity than French doors, especially on exposed elevations," says Nigel. "Aluminium and steel are much higher in embodied energy, but they are easily recyclable and, due to their high value, normally are – a major sustainability benefit versus PVCu."

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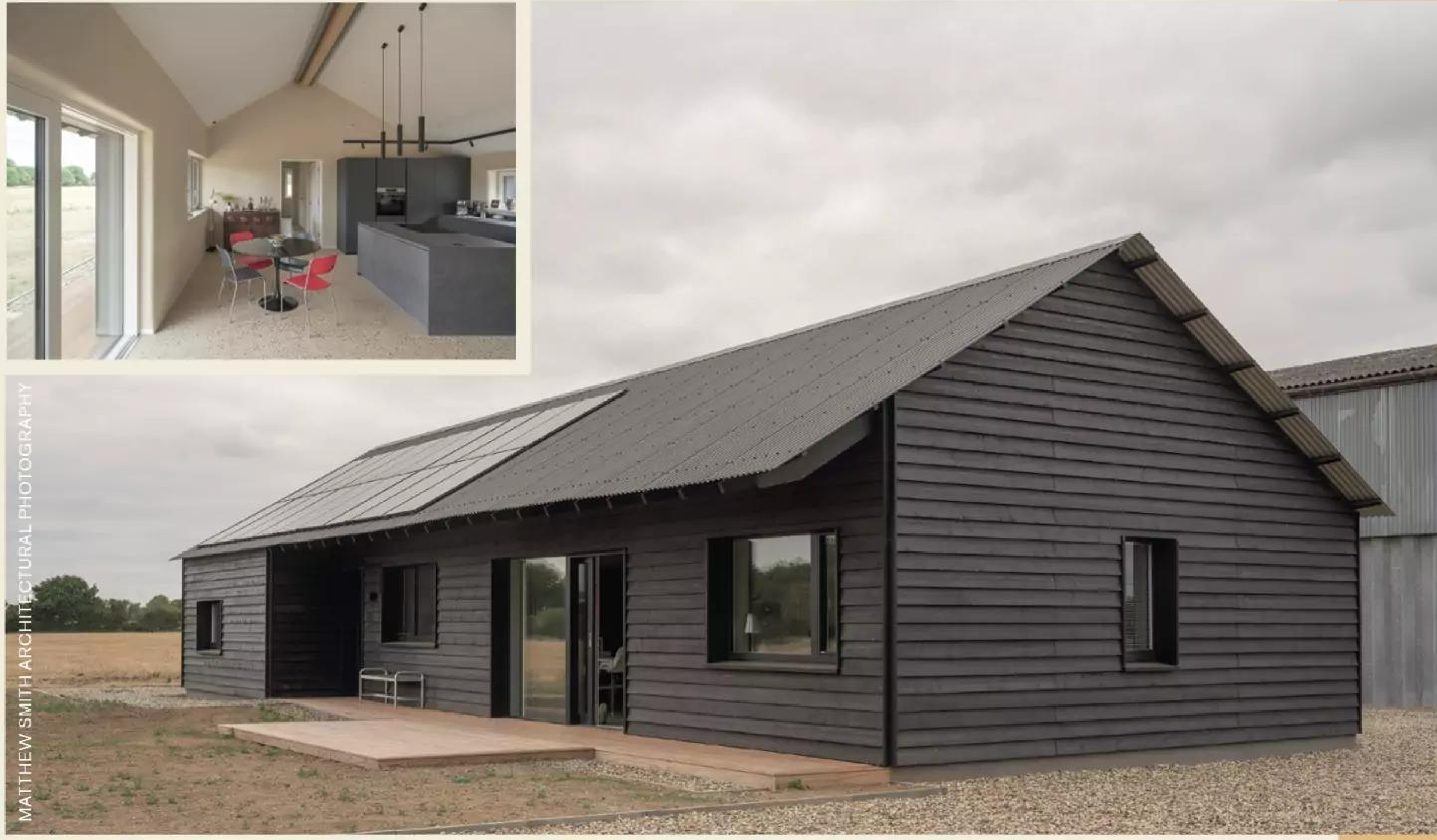
Energy-positive family home

ecoHaus glazing has helped deliver one of the UK's few Passivhaus Plus self builds

The owners of this striking home – which has been named Hayrick – wanted to create more than simply an energy efficient property. The young family wanted to achieve one of the UK's highest eco standards: Passivhaus Plus. Their vision was for a bio-based home that would not only produce more energy than it used, but also provide outstanding comfort and longevity, while treading lightly in terms of its environmental footprint.

High-quality window and door systems were key to match the precision and integrity of the rest of the build. The owners needed a partner with deep expertise in Passivhaus-standard glazing solutions. So, they turned to ecoHaus Windows & Doors, engaging the company as a technical partner at the early design phase. This approach ensured the bespoke glazing would integrate seamlessly with the prefabricated building fabric – thus fulfilling the project's ambitious performance targets and avoiding any pitfalls in terms of thermal bridging or air leakage.

Stanley Bragg Architects was appointed to develop a scheme focused on simplicity, while taking advantage of natural materials and modern construction in order to achieve exceptional performance. Along with the glazing, key features include EcoCocon's straw-panel structural system, cellulose insulation, an air source heat pump, deep roof overhangs to control solar gain, and on-site energy generation from a solar PV array.


MATTHEW SMITH ARCHITECTURAL PHOTOGRAPHY

FACT FILE

Project type	Self build
Location	Essex
House size	100.5m^2
Architect/designer	Stanley Bragg Architects
Accreditations	Passivhaus Plus
Glazing supplier	ecoHaus Windows & Doors
Glazing products used	Internorm HF410 & HV450 windows, and HS330 sliding doors
Glazing cost	Around £30,000 for a similar project & specification

ecoHaus Windows & Doors is a leading specialist in Passivhaus-certified glazing systems, and the exclusive distributor of Internorm products in the UK – specifying the HF410, HV450 and HS330 systems for this project

All in the detail

"Passivhaus success comes down to detail," says Craig Luff, MD at ecoHaus. "Our role was to ensure the glazing package worked in harmony with the straw panels, maintaining thermal continuity and airtightness without compromising on design." The company specified, supplied and installed triple-glazed Internorm window and door systems, featuring U-values as low as 0.68 W/m^2K – insulating against heat loss while allowing generous daylight into the home.

A combination of triple-seal gaskets, airtight frame-to-panel junctions and optimised glass coatings helped achieve the home's stringent airtightness and thermal standards. Solar control glazing was carefully specified in order to balance natural light with overheating mitigation, ensuring year-round comfort. The result is a home that achieves exceptional performance metrics, including 0.41 air changes per hour at 50 Pa, a space heating demand of just 13.4 kWh per m^2 of floorspace per year (KWh/m^2/a), and on-site renewable generation of 69.4 kWh/m^2/a.

The ecoHaus team managed the fitting and quality assurance process, including pre-installation airtightness checks and precision alignment to Passivhaus tolerances, working closely with contractor DCH Construction to maintain the project's detailing and integrity from design to completion. "Our in-house installation teams are Passivhaus-trained," says Craig. "This means we can guarantee that what's designed on paper is actually achieved in the build, and that's where real performance comes from."

Unlocking the good life

Now complete, Hayrick demonstrates how careful design integration – with key partners involved from the start – is crucial if you're keen to achieve exacting targets such as a verified net-positive energy building.

The finished house has exceeded the owners' expectations. Their home maintains stable temperatures, exceptional air quality and remarkable energy efficiency, all while showcasing a warm, contemporary aesthetic that celebrates the combination of natural materials and modern precision detailing.

For ecoHaus, Hayrick represents more than just another successful installation; it's a benchmark for how glazing can help unlock Passivhaus performance. "This project shows what's possible when glazing is treated as an integral part of the building fabric," says Craig. "Our team's expertise has helped to bridge the gap between design ambition and verified building performance."

CONTACT ecoHaus Windows & Doors
01453 837330 www.ecohausuk.com

Heating, ventilation & cooling

From heat pumps to smart ventilation, here's how to achieve consistent, low-bills and future-ready home climate control

WORDS CHRIS BATESMITH & DAVID HILTON

Right: Available in 3kW and 5kW variants, Kensa's Shoebox NX ground source heat pump offers a compact solution while still providing a manufacturer's coefficient of performance (COP) of 4.40 – meaning that, in optimum conditions, it's capable of delivering over 4kW of heat for every 1kW of electricity

windhager
BEST HEATING TECHNOLOGY

Below: Available in sizes from 10kW to 33kW, Windhager's Biowin2 Deluxe pellet boiler is 93% efficient and features intuitive touch screen control, a two-yearly maintenance schedule and a five-year warranty

Controlling your homes climate effectively is about more than staying cosy in winter. The right system will optimise performance, keep bills down, minimise future maintenance and ensure a consistently comfortable environment year-round. The best solution for you depends on factors such as:

- **Space heating demand.**
- **How airtight the house is.**
- **The emitters you choose (eg radiators or underfloor heating).**
- **Provision of domestic hot water.**
- **Your priorities on upfront costs, ongoing bills and carbon emissions.**

By balancing these factors, your project team will be able to start piecing together the right size and specification of systems to deliver your goals.

Central heating options

Assuming you're aiming for a well-insulated, airtight home, the space heating demand is likely to be pretty low. So, most systems will run efficiently. Once the government's Future Homes Standard (FHS) kicks in, it's likely that new build homes will no longer be able to connect to the gas network. The final regulations are expected in late 2025, becoming law from December 2026, triggering a 12-month transition period for projects to conform.

With electricity still roughly four times the price of gas, boilers remain a cost-effective option for space heating and hot water. But there's no denying options such as heat pumps are much lower carbon in use. If you're starting your self build journey today, the question is whether it makes sense to fit a system that looks set to become defunct.

Many self builders have already made the jump to low-carbon technologies. Mainstream systems that will remain supported under the Future Homes Standard include air source heat pumps (ASHPs), ground source heat pumps (GSHPs) and biomass boilers – all of which can deliver both space heating and hot water. They are also eligible for installation grants under the government's Boiler Upgrade Scheme. Here's a quick look at the pros and cons of each:

Air source heat pumps extract energy from the ambient air around the outdoor fan unit, which needs good airflow. ASHPs are straightforward to install and can comfortably and efficiently heat well-insulated new build homes up to around 300m^2 in size – where they're capable of producing three to four times more heat than the electricity needed to run them.

The colder the air, the harder the heat pump needs to work and the lower its efficiency – but it's worth remembering this technology is used successfully in much frostier climates than the UK. Larger properties may need multiple units, which could necessitate a three-phase power supply (adding to costs).

Typical install costs: £8,000-£12,000
BUS grant eligibility: £7,500
Carbon emissions in use: Low
Running costs: Medium (comparable to gas boiler)

Ground source heat pumps take their energy from the earth, via collector pipes buried either horizontally or in vertical boreholes. As the temperature in the ground is relatively stable, a well-designed GSHP should be slightly more efficient than an equivalent ASHP – making it low-bills and low-emissions tech – but it will cost much more to install. They tend to make most sense for well-insulated properties above around 250m^2 in size.

The heat pump unit, cylinder(s) and associated plumbing might take up roughly the space of four fridges. GSHPs over about 16kW will require a three-phase electricity supply. Horizontal loops are generally the most cost-effective. As a rough guide, a 200m^2 house might require 400m^2 to 600m^2 of suitable ground (more in poor soils). Digging can be undertaken at the same time as the rest of the groundworks.

Typical install costs: £20,000-£30,000 (budget another £8,000+ for vertical bore holes)
BUS grant eligibility: £7,500
Carbon emissions in use: Low
Running costs: Low

SUSTAINABLE HOT WATER

All the mainstream space heating options are more than capable of delivering plentiful domestic hot water. But specifying a dedicated solution could go even further in reducing your energy bills and carbon emissions.

One contender is solar hot water panels (solar thermal) – a proven, low-tech system. Provided you have a roof elevation facing anywhere south of east or west, solar thermal panels can satisfy about 60% of a household's hot water demand (more in summer; less in winter). You'll generally need around 1m^2 of solar collector per person living in the building, plus a suitable twin-coil cylinder to accept input from your main heat source and the solar panels. A typical system is likely to cost somewhere between £4,000 and £8,000 installed (including the cylinder). More online at: **self-build.co.uk/solar-thermal**

Another contender is to install a heat pump cylinder; a hot water vessel with an integral heat pump. Total Home Environment's HPW (often partnered with its HPV in Passivhauses and other very efficient homes) and Mixergy's iHP X are among the options. Prices range from around £1,500 to £3,000 plus installation.

Biomass boilers can burn a range of organic combustible materials, but are typically fuelled by logs, chips or pellets – the latter being the most common for self build homes. One of the benefits of biomass is that it produces high-temperature heat, which is useful for households with a high hot water demand.

Pellet boilers use automatic feeders linked to bulk storage – which typically needs to be large enough to store at least one or two tonnes of pellets. So, you'll need a sizeable plant room. The fuel can be bought in manageable bags, but is more commonly delivered by blower truck.

Install prices sit somewhere between ASHPs and GSHPs, with running costs comparable to the former. If your plot can yield a free supply of logs, you might consider switching to a batch boiler – this requires more user intervention (perhaps a daily burn in winter) but could provide you with near-free, zero-carbon heating.

Typical install costs: £12,000-£20,000
BUS grant eligibility: £5,000
Carbon emissions in use: Low (bought fuel); near-zero (own fuel)
Running costs: Medium/low (bought fuel); near-zero (own fuel)

Emitters & controls

Heat pumps and biomass boilers output to wet central heating – so you'll need to pair these technologies with suitable emitters. Underfloor heating (UFH) is hugely popular with self builders. It's easy to integrate into the fabric of a new home – whether it's embedded into an insulated concrete slab or a joisted system. Plus, UFH delivers the low-temperature, large surface area outputs that hit the sweet spot for heat pump performance. It can also enhance the performance of boiler-based systems.

That said, don't rule out radiators – particularly for rooms that only need brief bursts of heat, such as bedrooms and bathrooms. With good zoning, UFH and radiators can be used together very effectively. It's also important to optimise performance in-use by fitting intuitive, good-quality heating controls. Many systems now come with their own intelligent thermostats; or you might want to invest in smart home tech that gives you ultimate control over your home's climate.

Controlled air quality

Modern airtight homes need mechanical ventilation to deliver fresh air, filter pollutants and prevent condensation – protecting the wellbeing of both building and occupants.

One tried-and-tested strategy is mechanical ventilation with heat recovery (MVHR). These ducted systems extract stale air and pull a new supply inside. During the cooler months, they'll recover heat from the outgoing air to pre-warm the incoming supply – reducing the load on your primary system. Professional design and installation will ensure the system efficiently delivers the required volume of air to keep spaces fresh and healthy.

Whole-house systems

The UK is waking up to the potential of combined HVAC (heating, ventilation and cooling) systems, which can be very effective in low-energy homes. Innovations like The Unico System and Total Home Environment's HPV series deliver heating, cooling and air management through ducted vents. Some of these systems are fully integrated, others combine technologies to achieve the full effect.

All-in-one systems don't come cheap, but they can offer good value for the right project. Well-designed and installed, you'll benefit from a highly responsive heating and cooling setup that delivers year-round comfort and optimal humidity levels in a whisper-quiet package.

Above left: The Unico System is a whole-house HVAC solution, teaming a central air handling unit with a heat pump to provide optimum comfort levels. The main unit and supply duct is typically housed in a loft or plant room, with conditioned air gently and efficiently pushed into each room via small-diameter ducts and discreet ceiling, wall or floor vents

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Stoves for modern homes

What you need to know when specifying a stove or fire for your low-energy home

Fancy something other than a giant flat screen TV as the focal point in your new living space? There's nothing quite like the flickering flames and warm glow of a fire to create a cosy and intimate vibe. Open fires are out, however: you can't build to modern regs and then punch a chimney-shaped hole in the airtightness layer. So, what are the options for self builders creating high-performance homes?

The solution lies in enclosed designs, such as stoves and cassette-type fires. But there are some significant considerations before you take the plunge. Are you set on a woodburner or would you consider an alternative appliance? What kind of heat output is suitable? And can you really have a solid fuel stove in an airtight house?

Design & type

From heritage styles to glass-box corner designs, there's a huge range appliances to choose from in a variety of fuel types. Nothing beats a logburner for pure views of the fire, not to mention the sweet scent of the wood as it combusts. Gas fires do offer real flames, of course, without the characteristic crackle. Electric versions have come on leaps and bounds, though, with models such as Onyx Avanti and Eurostove's ilektro offering optional real-wood log beds and multi-source LED lighting effects.

Output & controllability

In a high-performance home, you may only need a small amount of heat to take the chill off in a given room. You'll also want to precisely manage that output to avoid turning the place into a sauna. These aspects can be a challenge for larger woodburners. If a stove's rated at a nominal output of 5kW, it might be able to operate at a range between around 2kW and 7kW. But it isn't easy to maintain the lower end of that scale while also ensuring an efficient, clean burn. Some manufacturers – such as Saltfire – offer low-output models in the 1kW-3kW bracket, but design choice is currently fairly limited.

Gas and electric stoves, meanwhile, offer significantly more control over outputs, delivering warmth at precisely the required level (some even offer app control). What's more, with electric models you can even choose a no-heat mode that simply gives you the flame visuals.

Efficiency & emissions

One of the biggest advantages of using wood as a fuel is that – providing it's responsibly sourced from woodlands with appropriate replanting schemes – it can be almost carbon-neutral. It must be properly dried and seasoned (look for the Woodsure Ready to Burn badge). In terms of air quality, modern Ecodesign-ready and DEFRA-exempt stoves are built to stringent standards to deliver a clean burn with minimal emissions.

Stoves that run on mains gas can't compete on carbon emissions. Electric fires are much lower impact in use, as they don't directly produce any combustion-related gases – but bear in mind that, unless you're on a fully renewable energy tariff, they're not entirely emissions-free.

Above: The Rurostove ilektro 1250 electric fire can achieve a controlled output of between 0kW and 2kW. It offers an optional real-wood bed, LED flame effects, a realistic crackle sound and a programmable seven-day timer

Left: Stovax's Riva2 range of woodburning and multi-fuel stoves feature an integrated external air connection, meaning you don't need to purchase an extra kit to make them suitable for airtight houses

Air supply

Any stove or fire with a real flame (ie woodburning/gas) requires oxygen for combustion. Traditionally, this is taken from the room air and replenished by the leakiness of the building fabric. That's not an option in airtight houses, so your stove will need to have a direct air supply – whereby external air is piped directly into the appliance. Many, though not all, modern stoves offer this functionality.

An external air kit is also vital for any home featuring MVHR. This must be in a total direct air (leak-free) configuration to avoid issues with negative pressure in the room. Stoves with DIBt certification (a German standard) offer the reassurance that they've been specifically evaluated to test the effectiveness of their room seal.

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RENEWABLE POWER

SOLAR, WIND & WATER

Amandine Lefevre sets out what to consider when specifying sustainable energy solutions for your home

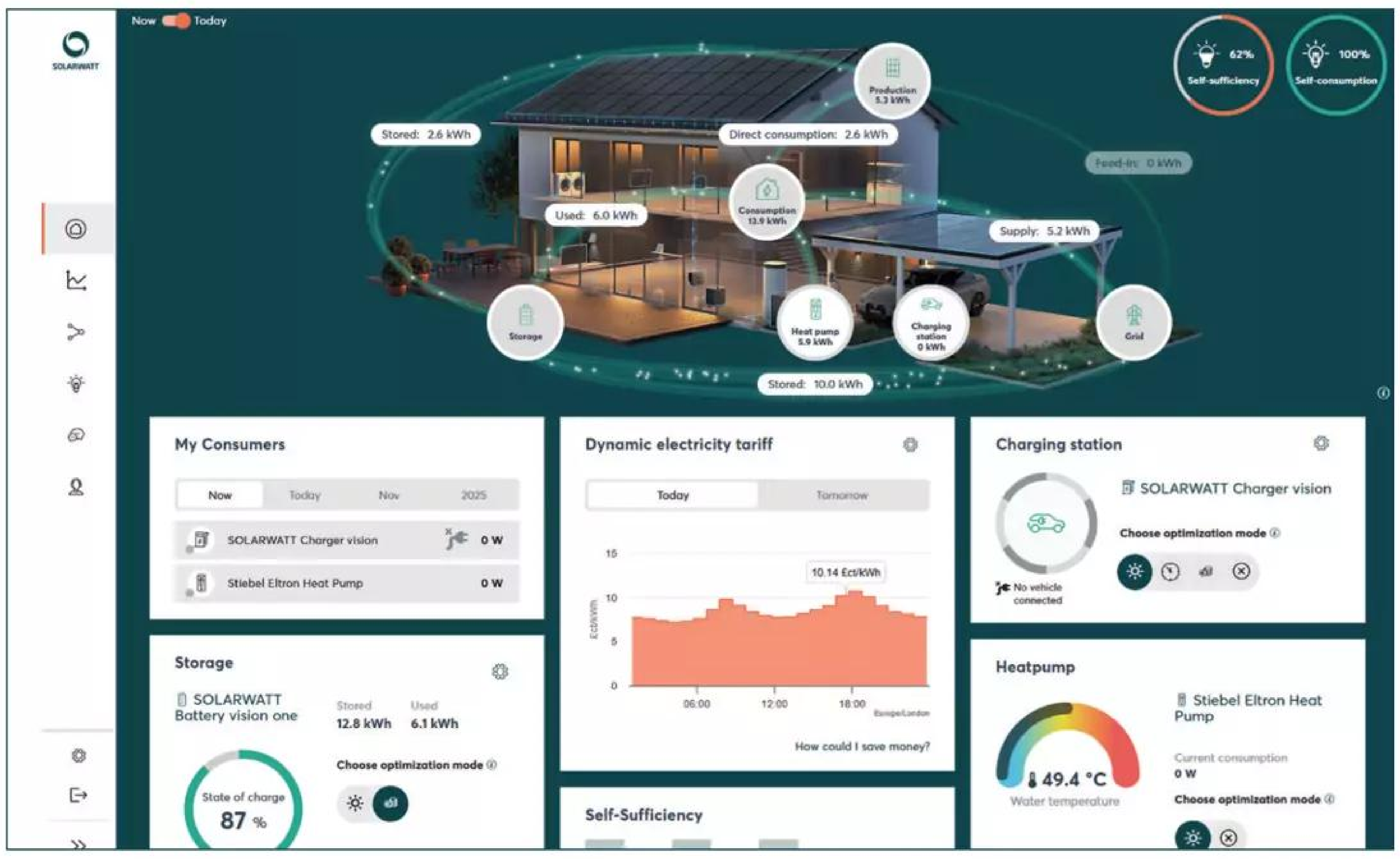
Above: Winner of Best Eco Home at the 2024 Build It Awards, this stunning project in Northumberland combines a highly efficient house shell by SIPS@Clays (www.clays.com) with solar and wind power – resulting in net zero energy bills

With energy prices showing little sign of falling, it's no surprise that homeowners are increasingly turning to renewable energy systems such as solar PV to take greater control of their energy use. Advances in technology, batteries and smart-tariff options – plus the proposed 2027 Future Homes Standard requiring solar panels – are making these systems a must-have for self builders. But if you want to get the most from clean, site-based power, it's not simply a case of shoehorning maximum panels onto a south-facing roof. Here's what you need to consider on your eco-friendly build project.

What is solar PV?

Solar photovoltaic (PV) systems generate electricity by converting light energy (photons) into electrical energy (volts). Each PV cell produces only a small amount of electricity, so multiple cells are combined into modules. Several modules form a panel, and when multiple panels are linked together, they make up an array. Alternatively, you might choose to select a solar tile system; this operates on the same principle, but the array is made up of individual roof tiles which are attached to your build.

The electricity produced by PV cells is direct current (DC) at a relatively low voltage. Unless it is used purposely for low-voltage DC devices, it must be converted to 240V alternating current (AC) – standard household electricity – by using an inverter. The panels are cabled back to the inverter, which then feeds the power into the house's main consumer unit (via a circuit breaker).



Stored: 2.6 kWh
Direct consumption: 2.6 kWh
Feed-in: 0 kWh
Used: 6.0 kWh
Supply: 5.2 kWh
Stored: 10.0 kWh

My Consumers
SOLARWATT Charger vision 0 W
Stiebel Eltron Heat Pump 0 W

Dynamic electricity tariff
10.14 €ct/kWh

Charging station
SOLARWATT Charger vision
Choose optimization mode
No vehicle connected

Storage
SOLARWATT Battery vision one
Stored 12.8 kWh
Used 6.1 kWh
Choose optimization mode
State of charge 87 %

Heatpump
Stiebel Eltron Heat Pump
Current consumption 0 W
49.4 °C Water temperature
Choose optimization mode

Above: Solarwatt's home energy hub integrates solar, battery storage, electric vehicle EV charging, heat pumps and tariffs into a single dashboard for ultimate control

Installing solar panels

As with many aspects of home design, it's a good idea to involve your installer early on. They can help identify any restrictions – such as potential shading from nearby trees or even the design of your home's roof. A south-facing pitch is generally considered the most ideal setup, although east- and west-facing installs can also work well – especially for households whose energy demand peaks in the mornings (east) and/or afternoons (west).

Most self builders opt for in-roof or integrated PV, fitted in line with the roofing materials for a sleek finish. A pitch of around 35° helps ensure the array captures maximum sunlight and maintains strong year-round energy production. Mounting systems can help achieve this on flat or low-slung roofs, or even ground-level arrays.

For most installs, the roof design will be the main limiting factor on the number of solar panels you can install and the amount of clean power you can generate.

Specification plays a significant part, too. Most systems produce around 300-450 watts (W) of power per panel, but high-end versions may deliver 500W or more – which could unlock the full potential of a smaller roof.

If you have a large roof, you may not need to use the entire area to satisfy your energy needs. "In that case, it's worth estimating how much electricity a full system could generate annually," says Rhiannon Jones, technical sales manager at GB-Sol. "Compare that with your expected yearly energy consumption, and then decide how closely you want the system's output to match your usage."

Solar PV costs

Pricing varies widely depending on system type and complexity. "For an 8kWp system, our installed prices start from around £14,000 for integrated solar panels, £23,000 for an Infinity seamless glass roof system, and £19,000 for PV slates – all with SolarEdge optimisers," says Rhiannon. Bear in mind that integrated panels and solar slates double as the roof covering, saving money versus systems mounted above the tiling.

Ultimately, selecting the best solar panels isn't just about price – there are a range of factors to weigh up. "In addition to budget, it really comes down to what's most important to you in the build – whether that's sustainability, cost or aesthetics," says Rhiannon.

Battery systems

When it comes to solar batteries, the upfront cost can be significant. "You're looking at roughly £5,000 to £10,000 for a battery system, depending on the size and specification," says Rhiannon. But the financial benefits aren't as straightforward as you may think.

To make the most of a battery over a typical 10-year warranted lifespan, you'd need to save around £500 to £1,000 a year on your electricity bills. That's a tough target. If you have a smaller PV system or are typically at home during peak generation times, a battery may not be worth the investment. Instead, look to the export tariffs available from suppliers. "There are good rates available for exporting electricity," says Rhiannon. "In some situations, they can save you around £40 a month."

If you're not at home during the day or you have a larger system, a battery could be worth considering – as it will store excess power during the day for use in the evening and overnight. "Adjusting your energy consumption habits, such as scheduling energy-intensive activities during peak generation times, is a worthwhile practice to establish once your system is set up," says Nigel Griffiths, Build It's sustainability expert.

With dynamic pricing becoming much more common, there are now greater opportunities to earn more by strategically storing and exporting energy. "Under certain tariffs, your battery can charge using grid electricity when it's cheap or abundant and you can get paid a premium for exporting the energy during peak demand –sometimes up to 25p per kilowatt-hour," says Rhiannon.

Some providers are now able to supply fully-integrated solutions, allowing you to take a holistic approach to energy management. In premium systems, such as Solarwatt, the panels, inverters and batteries are all streamlined into a connected product which is controlled by an easy-to-use app. "It's the software that is the key to maximising integration and efficiency, so the homeowner can get the maximum benefit from their system," says Yen Dai, director of Eco Energy Environment.

QUICK GUIDE HYDROPOWER

If you're lucky enough to have access to a constant flowing water source on your site, you could consider installing a micro-hydroelectric system. Hydropower is a simple and reliable energy source with minimal environmental impact. Unlike solar rays, water flows consistently all year-round, providing you with a predictable supply of electricity.

Micro-hydro systems are particularly well-suited for small-scale, off-grid projects – such as individual homes or community developments. The right type of turbine depends on site conditions, especially the available head (the height difference from the water source to the turbine) and flow rate. Where there's high head and low flow, for instance, an impulse or Pelton turbine is often specified; whereas an Archimedes screw solution would suit a low head and high flow.

Build It expert Nigel Griffiths was part of the team that worked on the installation of this small hydroelectric turbine in Otterhead – a completely off-grid nature reserve near the Somerset/ Devon border

QUICK GUIDE WIND POWER

Like solar PV, wind turbines generate electricity from a clean and renewable source of energy. Of course, wind doesn't always blow, so it's unrealistic to expect it to power your home entirely. However, while output fluctuates, it's not seasonal like solar PV – so can still perform well during the winter months.

Small wind turbines often get confused with their large wind-farm counterparts, which have faced criticism for noise and visual impact. In reality, domestic turbines are far quieter and less intrusive on the landscape. When it comes to installation, they can be fitted to buildings or erected as standalones. Some models require guy ropes and therefore have a larger footprint.

To perform efficiently, wind turbines will need to be positioned high and clear of any nearby obstacles, making them best suited to homes with ample space. With that in mind, they tend to work best for more rural properties.

Above: The Infinity solar roof, by GB-Sol, is a seamless edge-to-edge glass PV roof with an impressive power generation capacity

CONTACTS **Eco Energy Environment** 0330 900 0141 www.eeelimited.com **GB-Sol** 01443 841811 www.gb-sol.co.uk **Leading Edge Power** 01981 241668 www.leadingedgepower.com **Segen** 0330 900 0141 www.segen.co.uk **Solarwatt** 020 3966 1952 www.solarwatt.co.uk

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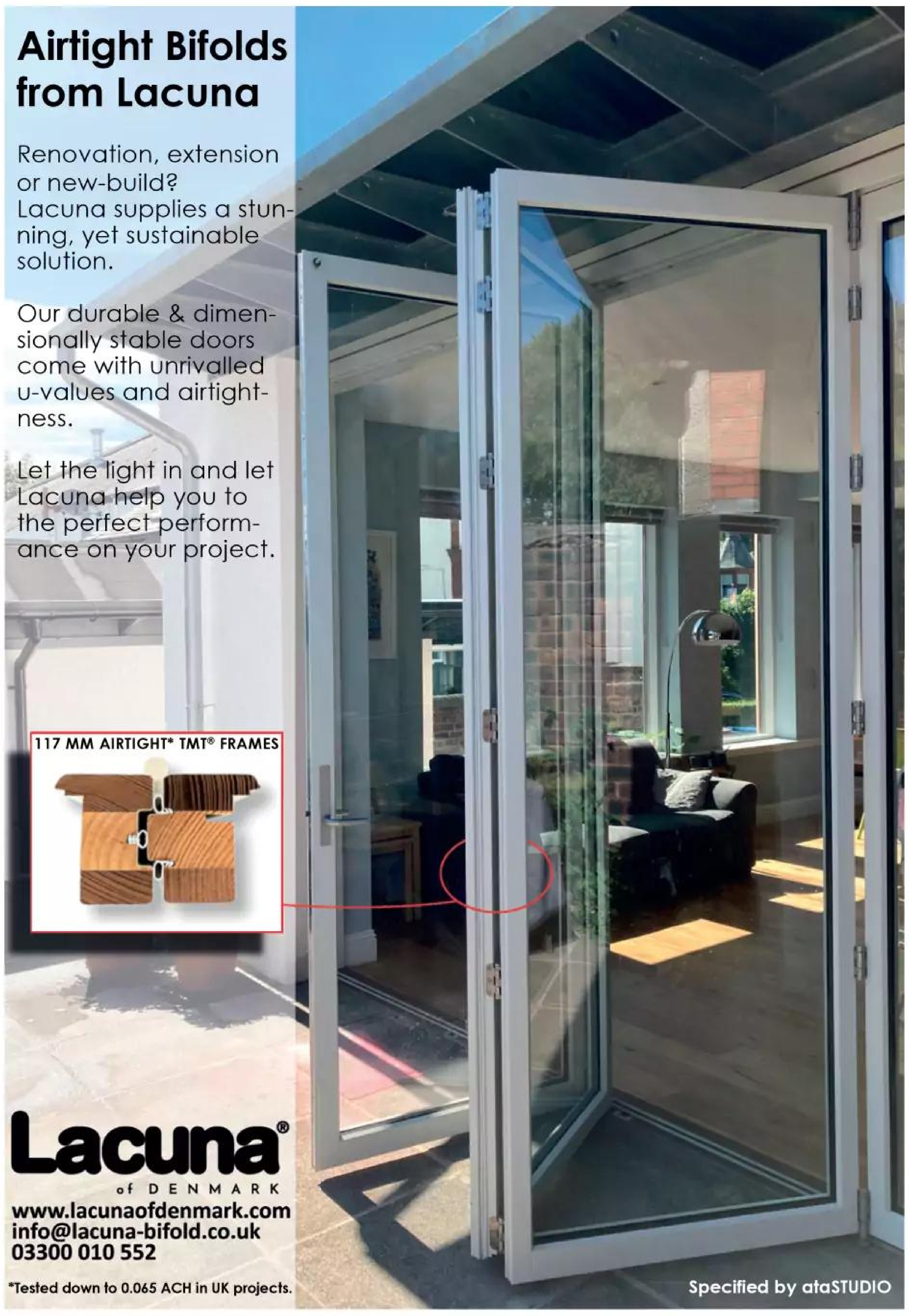

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Water efficiency & sustainable drainage

Top tips to bring your water and waste strategy in line with other elements of your project

WORDS CHRIS BATESMITH & NIGEL GRIFFITHS

Water and drainage aren't exactly at the glamour end of eco home building, but they demand early attention. Using and disposing of water efficiently around the home protects a precious resource. What's more, in some parts of the country, local authorities are actively limiting house delivering because water demand already outstrips supply. So, adopting best practice can make a tangible difference in meeting local housing targets (and, by extension, enabling more one-off builds to go ahead).

Saving water

Water use varies from one household to another – but an often-quoted figure is that the average person in the UK uses 150L per day. In new build homes, Part G of the Building Regulations sets a stricter limit: 125L per person per day (pppd), with the option for councils to take that down to 110L. The government has recently launched a consultation on the next generation of Part G, which is likely to tighten these thresholds 105L pppd (100L in areas of water scarcity). It expects these changes to save homeowners an average of £111 per year on water bills; though it's not set a timeline for likely implementation.

Getting to this kind of level isn't rocket science, but it still needs planning and calculation. For instance, the best water-efficient toilets achieve dual-flush volumes of 4L/2L, versus more like 9L for older single-flush WCs. Adding a delayed-action inlet valve will trim this even further. Low-flow showers typically run at just 6-8L/min, introducing air into the shower head to give a pleasing experience. Some now come with integrated timers, too. New washing machines and dishwashers will be pretty efficient, too.

If you want to go the extra mile, you'll need to look at technologies like rainwater harvesting (RWH). This collects the rainfall on roofs and repurposes it to flush WCs, supply washing machines, irrigate the garden, wash the car etc (essentially anything that doesn't require the use of drinking quality water). A decent system costs around £2,500-£3,000 for the average new build home, and could net payback in under 20 years (perhaps sooner, given planned price hikes in water bills).

The next level up is to install greywater harvesting – recycling water from showers, handbasins and washing machines in order to flush WCs. The water requires filtering and disinfecting before it can ve reused. So, systems are significantly more complex and expensive than RWH – but they will undoubtedly reduce mains use.

ISTOCK.COM/WILLOWPIX

Above: Greater instances of heavy rainfall have the potential to overload storm drains; but self builders can do their part to reduce the pressure with SuDS systems and other measures

Left: The Biorock Ecorock 5010, available from Below Ground Solutions, is a non-powered treatment plant, offering a low-energy and low-input alternative to septic tanks in off-mains locations

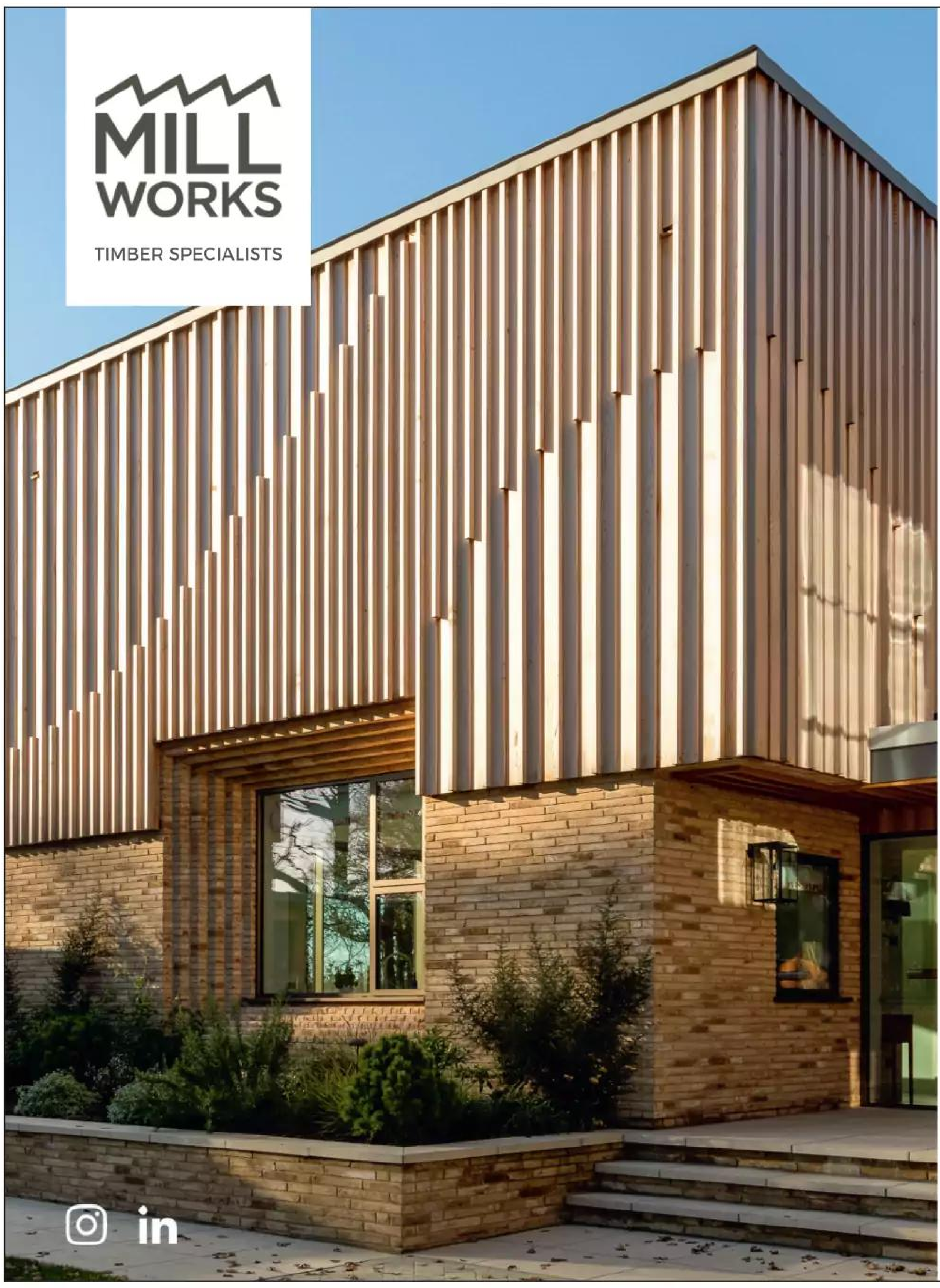
Sustainable drainage

There are two main types of water that need to be taken away from our houses: sewage (the waste from baths, sinks etc) and rainfall (known as surface water).

The best way to address surface water is with sustainable drainage systems (SuDS) – either by using permeable surfacing materials (such as gravel or permeable block paving) or by holding water on site and releasing it slowly into the drainage system (attenuation). Depending on the plot, this could be achieved via a pond or low patch of land with a small outlet; or by installing a geocellular attenuation system.

For most of us, the most effective way of dealing with waste is to connect to the mains sewer system. If your site can't be cost-effectively connected, then you'll need to look at alternatives such as domestic waste treatment plants (unpowered versions can bring energy savings) or a professionally designed reed bed system (these can be so effective that the eventual run-off is drinking quality water). Composting toilets are another option, although may be a step too far for all but the greenest developers.

CONTACTS **Below Ground Solutions** 0870 863 0123 www.belowgroundsolutions.co.uk **Brett Martin** 01246 280000 www.brettmartin.com **Graf UK** 01295 559500 www.grafuk.co.uk **Marsh Industries** 01933 654582 www.marshindustries.co.uk **Rainwater Harvesting** 01733 405111 www.rainwaterharvesting.co.uk **Wavin** www.wavin.co.uk



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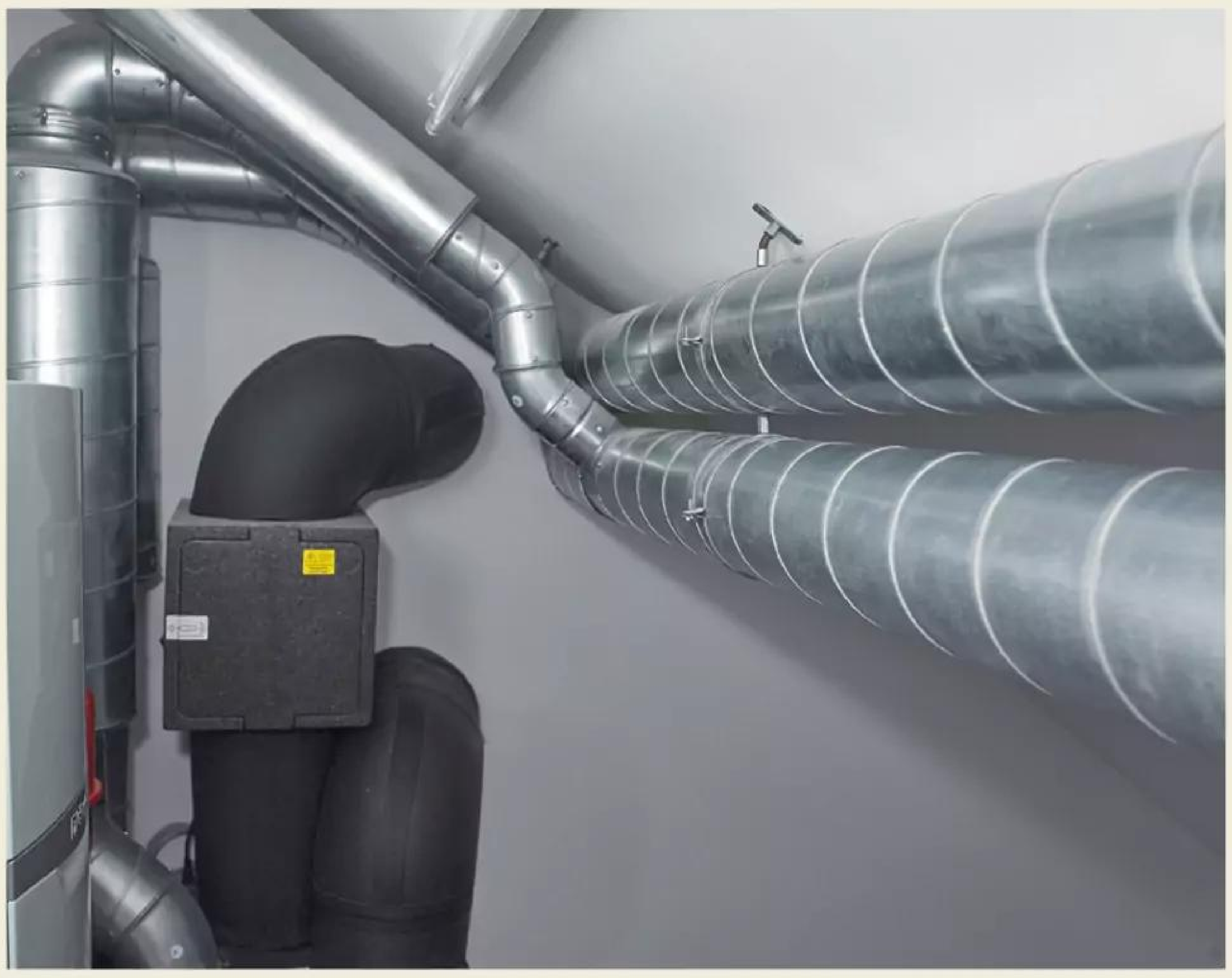
MVHR DESIGN

WHY PERFORMANCE IS KEY

Don't make the mistake of focusing too much on brand when specifying your MVHR, says Tom Heywood from 21 Degrees. Whole system performance is king



Above: Working with a range of MVHR unit suppliers, including Airfi, gives 21 Degrees flexibility to design the right system for the project – rather than rely on just one brand

Left: With a super-airtight rating of 0.26 ach@50Pa, quality ventilation and heat recovery was a must in 21 Degrees' Golcar Passivhaus. The MVHR system design features rigid steel ducting and a Passivhaus certified unit

Self building gives you the chance to create a well-insulated, airtight new home that conserves energy and improves your health and wellbeing. Mechanical ventilation and heat recovery (MVHR) is a crucial technology in turning that dream into a reality.

Correctly designed and installed, MVHR will deliver the correct airflow to maintain optimal indoor air quality and comfort in your low-energy home. In turn, this supports the overall health of both the occupants and the fabric of the building – preventing issues like condensation and mould growth. Plus, a well-designed MVHR system will minimise heat loss by recovering heat from the exhaust air. Importantly, it does this super quietly – in fact, that it should be inaudible.

Box-ticking vs performance

There are two approaches to specifying an MVHR system. The first applies to projects where installing a ventilation system is seen as more of a needs-must solution, purely required to meet Part F of the Building Regulations. In this scenario, it effectively becomes a box-ticking exercise – and almost always a missed opportunity. Yes, you'll do enough to satisfy the Part F paperwork, but that's about as far as it goes.

The second, and better, path is where a high-quality system is specifically designed to ensure optimal health and comfort for the occupants, protect the building fabric and maximise heat recovery for improved energy efficiency. This will deliver long-term benefits by reducing your bills and ensuring your home performs for you day-in, day-out. So, don't risk the quality of your build: choose a solution that's about delivering more than just the minimum standard.

Pitfalls of poor design

As the popularity of MVHR increases, so too does the risk of inadequate installs from inexperienced designers and trades. When systems fail, 95% of the time the issue can be traced back to the lack of a good design or a poorly executed one. Often, these designs are simply schematics showing where the ducts should be placed but fail to address the key aspects of performance. Working with skilled specialists, who have a track record of project success, is vital to avoid these fundamental issues.

High-quality MVHR

The two core ingredients in an MVHR system are flow rate (the volume of air it moves through the building via the ducting) and decibel rating (how loud the system is). Crucially, these factors should be considered across the whole system – not just the MVHR unit itself.

One of the biggest mistakes is focusing on product specification first. It's not uncommon to see requirements like "the MVHR unit must be from X manufacturer." The problem is, this steals focus from system performance, which can only be maximised if there's flexibility to choose the right products to meet the project goals.

So, instead of specifying a brand, an example of a good brief might be that the MVHR system design must:

- **Deliver 30m³/hr per person.**
- **Ensure sound levels in habitable spaces do not exceed 25dB(A).**
- **Keep the total static pressure under 100Pa.**
- **Ensure air diffusers are positioned for optimal airflow.**
- **Be backed by an indemnified design agreement (so you're protected in case of design flaws).**

The key takeaway is to always prioritise a performance specification over a product specification. The effectiveness of your MVHR system is determined not by the brand or particular unit, but by the quality of the ducting design and how efficiently air moves through it. To achieve best results, the planning and installation phases must address your specific project requirements.

TOM HEYWOOD is head of design at 21 Degrees and a certified Passivhaus designer, with 11 years' experience planning and advising on high-quality MVHR systems. 21 Degrees' MVHR service ensures that your system is not only inaudible, but also delivers the necessary airflow for health, comfort and efficiency – all while keeping running costs low thanks to its low-pressure ducting design. The team designs, supplies and commissions systems on site to ensure they perform as intended – eliminating the performance gap that can occur with poorly-installed systems. Call **080 8281 5021** or visit **www.21degrees.com** for more information.

Choosing sustainable materials

Amandine Lefevre looks at a range of eco-conscious building products – some already mainstream; others more recent innovations – that could help you achieve a stylish, healthy and low-impact home that performs over the long term

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INSULATION

Available from PYC Group, Warmcel can be used as a loose-fill or blown insulation. It's made from recycled newspaper, with non-toxic treatments for fire and mould resistance

Choosing the right insulation is key to creating a comfortable, efficient home. Rigid plastic boards are affordable and high-performance, while mineral wool is a breathable, acoustically sound option. However, if embodied carbon is a top priority, bio-based materials could be a better fit – especially for timber frame builds, where it can be integrated early on in the process.

One option is cellulose (recycled newspaper) insulation, such as Warmcel or Thermofloc. "It's blown under pressure into timber frame cavities and panels for a complete, consistent fill," explains Jasper Meade from PYC Group, UK distributor for Warmcel. "In new builds, it's typically used in the walls, but for roofs and lofts, it can be installed at any stage of a renovation project."

Wood fibre insulations, such as Steico and Soprema Pavatherm, are made from waste wood or byproducts of the timber industry. They're great at regulating moisture, offer excellent acoustic performance and have a high heat storage capacity (buffering extremes of temperature). But, it's important to bear in mind that you'll need a thicker layer to achieve the same performance as plastic or mineral wool insulations.

Other popular products include sheep's wool (typically sold in rolls, batts or loose fill formats) and the likes of hemp or jute-based insulations.

EXTERNAL CADDING

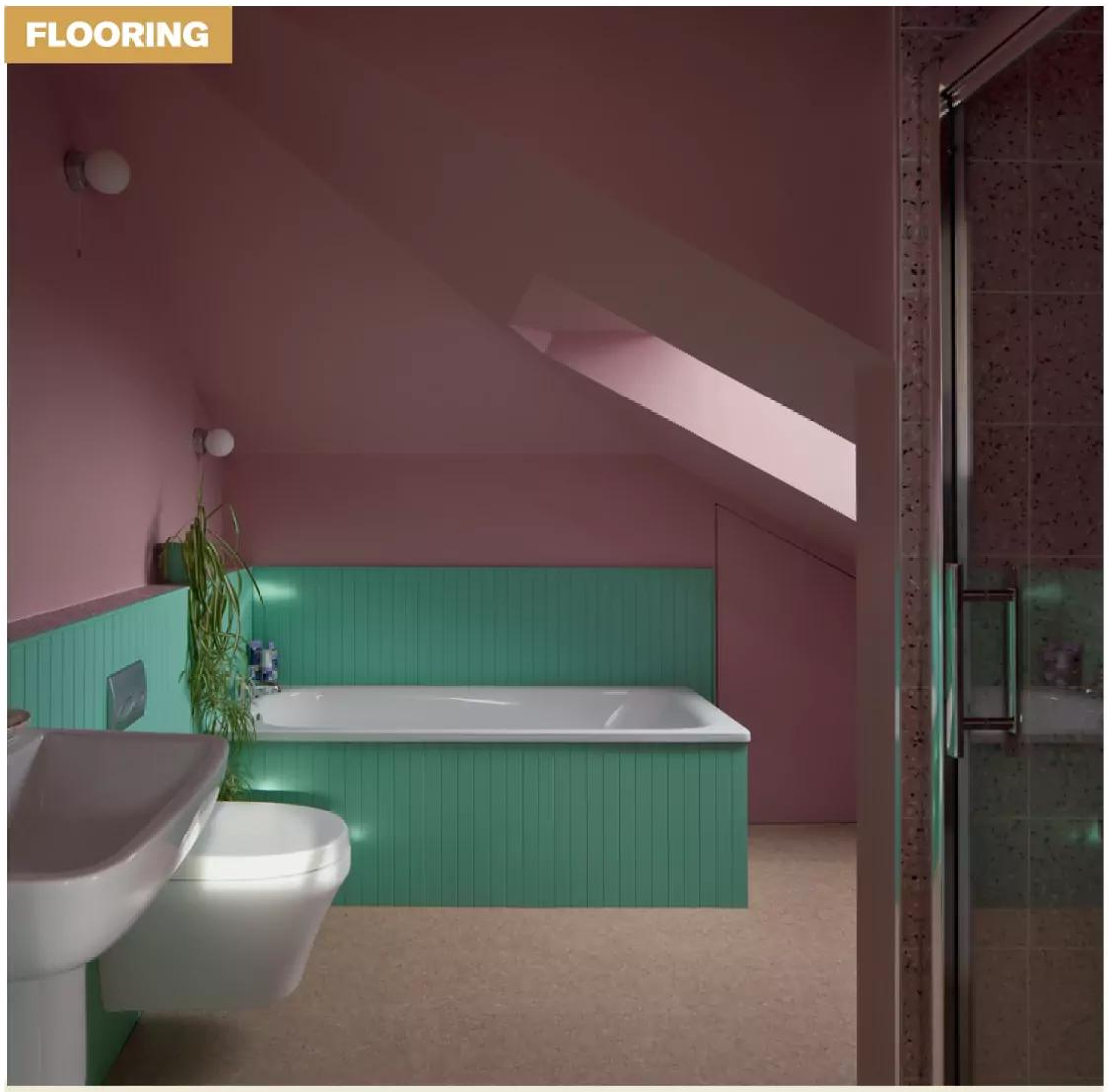
Russwood's Thermopine is engineered to maximise durability and long-term weather resistance. It's made by thermally modifying Scandinavian-grown Scots pine, enabling the factory-applied finish – in this case an ebony-hued Microtex coating – to last up to three times longer than with conventional timber cladding

Responsibly sourced timber offers a great combination of looks and performance. The wood could come from forests managed with active replanting programmes or be salvaged from older buildings for a second life. Some species can also be thermally modified to boost durability without the need for chemical treatment. Good ventilation – at least a 20mm clear cavity behind the boards, with openings at the top, bottom and ends of the timber – is vital to protect the boards.

Composite cladding, typically made from recycled materials such as wood fibre or waste plastics, offers long-lasting performance with minimal upkeep. Its eco credentials do, however, depend heavily on the raw materials used, recyclability and manufacturing process.

Metal claddings require significant processing, but the likes of steel and aluminium are recyclable. And some brick manufacturers are now producing low-carbon products – check out page 98 to read sustainability expert Nigel Griffiths' insights on the options.

FLOORING



Long gone are the days when we had to choose between practicality, aesthetics and sustainability in floor finishes. Responsibly sourced timber is a go-to choice, offering timeless character in both solid and engineered varieties – the latter is best if you're fitting underfloor heating (UFH). Quick-growing materials such as cork or bamboo are strong alternatives to exotic hardwoods and offer a natural warmth.

Natural stone offers outstanding longevity, with local varieties significantly reducing embodied carbon. Plus, many stone tiles pair very effectively with UFH. Porcelain and ceramic are worth considering for their durability and versatility, but do need firing – so they have a higher embodied energy.

Whatever material you opt for, it's important to consider any adhesives and finishes. Solvent-based urethane varnishes are high in VOCs, for instance, which will have an impact on indoor air quality.

In this family bathroom – part of a project by Studio McMillan and Mind the Gap – a cork floor was chosen for its natural finish, warmth underfloor and resistance to staining

PLASTER & FINISHES

Plaster and wall finishes are a crucial element of an eco home's design and performance. Clay and lime plasters are natural, breathable and low impact, helping to regulate indoor humidity and contribute to a healthier living environment. You could also consider an insulating plaster for additional efficiency, such as Adaptavate's Breathaplaster Thermal or EcoCork Lime Render (available from Ty-Mawr).

Some eco plasters can be pigmented at the mixing stage, providing a through-colour effect in a range of muted tones. Alternatively, look for breathable, non-toxin paints – natural options include clay, lime, chalk and casein – that will preserve the organic quality of the substrate.

Clayworks' natural clay plaster provides a tactile, low-impact finish in this stylish project

PLASTERBOARD ALTERNATIVES

Standard plasterboard is cheap and easy to install, but natural alternatives like wood wool, plywood and new bio-based boards can reduce impact and offer excellent performance benefits. Just bear in mind that your choices will be more limited if you need fire-rated or moisture-resistant boards.

A largely natural product, made from long wood fibres held together with a binder, wood wool boards are breathable, moisture-regulating and improve acoustics. Innovative options such as Adaptavate's lightweight Breathaboard offer similar benefits, plus they're easy to install and biodegradable at end of life.

Plywood can be an interesting option. Look for products that use sustainable, zero-formaldehyde adhesives to bond the layers. This cross-layered engineered timber is strong, stable and versatile – making it a great choice for the internal wall face in plant rooms, kitchens and other areas where you want to hang heavy items off the walls.

As a natural alternative to plasterboard, Fibrolith wood wool boards from Unity Lime are designed to boost acoustic and thermal performance

CONTACTS

Adaptavate 01453 827800 www.adaptavate.com **Clayworks** 01326 341339 www.clay-works.com **Mike Wye** 01409 281644 www.mikewye.co.uk **Mind the Gap** www.mind-the-gap.space **Russwood** 01540 673 648 www.russwood.co.uk **Soprema** 0330 058 0668 www.soprema.co.uk **Steico** www.steico.com **Studio McMillan** 07484 638858 www.studiomcmillan.com **Thermacork** www.thermacork.com **Thermofloc** www.thermofloc.com **Ty Mawr Lime** 01874 611350 www.lime.org.uk **Unity Lime** 01844 896009 www.unitylime.co.uk **Warmcel** 01938 500797 www.warmcel.co.uk

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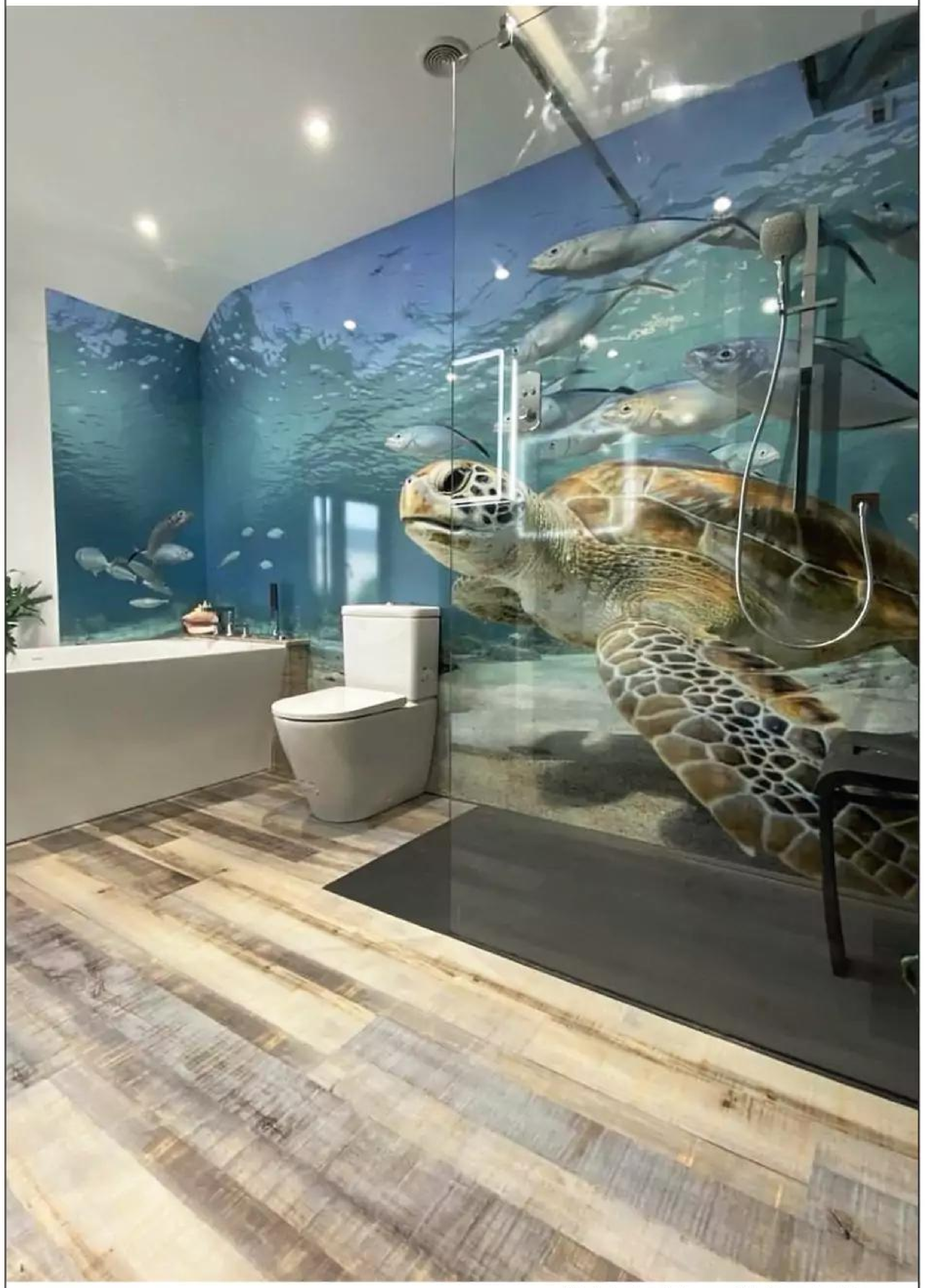

Photo: Lydney Bathrooms Ltd. Gloucestershire

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Designing for biodiversity

Scarlett Deamer investigates how you can create a property that respects and nurtures the surrounding habitats

Building a brand-new home affects the local environment and the species that live there. Considering biodiversity from the start of your self build journey helps to avoid disrupting vital wildlife while preserving the natural landscape. Here I'm looking at current biodiversity legislation, the importance of ecological surveys and exploring some architectural features that you can incorporate into your build scheme to support your local environment.

BRUCE HEMMINGS

Above: Build It readers Jenny and Julian Sawyer commissioned a tree report, bat survey and wildlife survey to check for protected newts when applying for planning for their timber frame home in Kent. One bat was discovered and re-homed in the surrounding woods with new bat boxes (www.fjordhus.com)

Biodiversity net gain

Biodiversity net gain (BNG) laws have been introduced by the government throughout England to ensure that housebuilding developments do not damage wildlife habitats. As of the 12th February 2024, it became a legal requirement to achieve an increase in the biodiversity of a building development's area by 10% upon its completion.

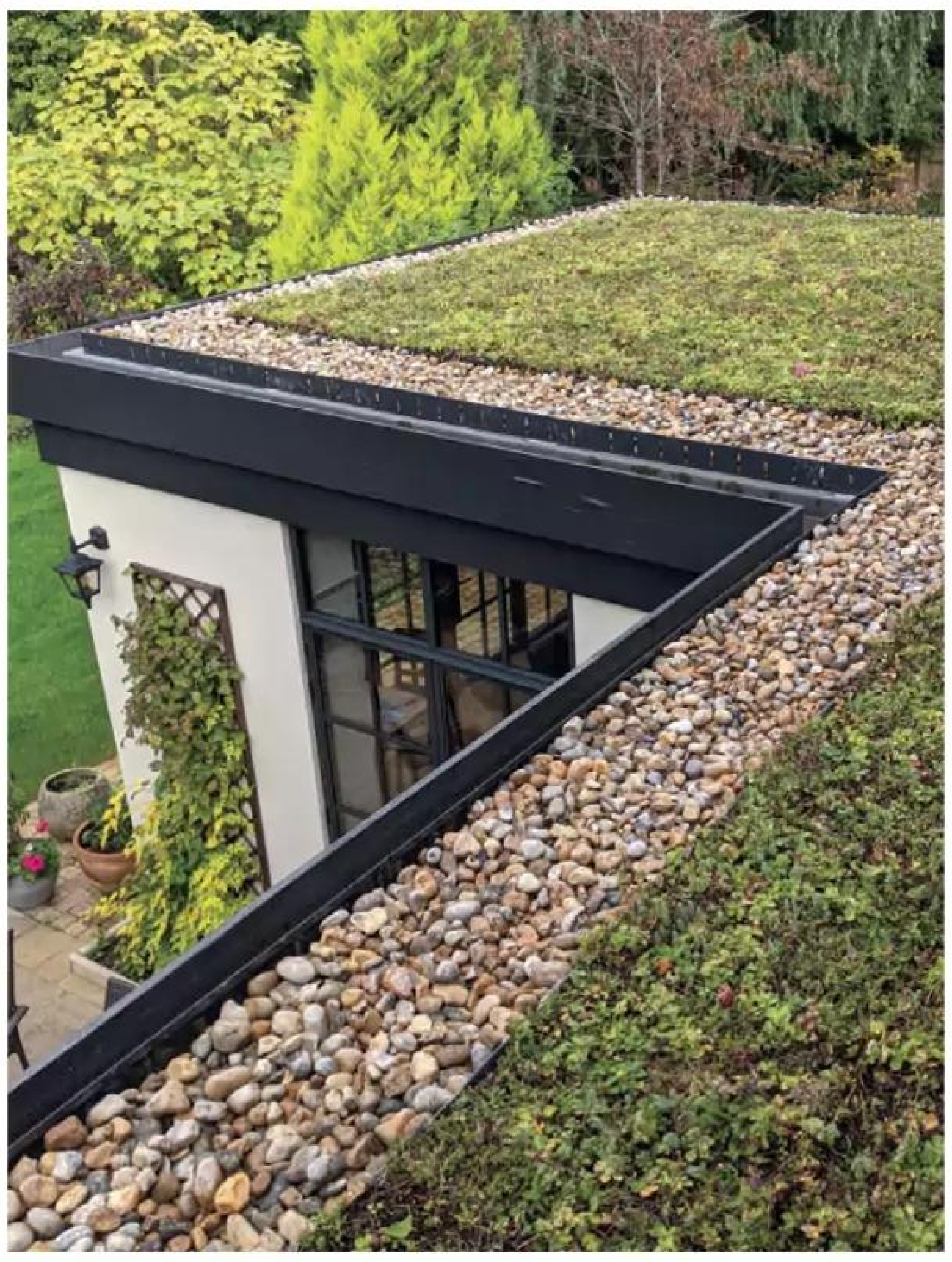
There's an exemption for developments of less than nine dwellings and where the site is no larger than 0.5 hectares - which accounts for most bespoke home builds in the UK. You also need to make sure that your project is a self build as described in the Self-build and Custom Housebuilding Act 2015, otherwise you won't be exempt. Of course, you want to hit or even exceed this target anyway as part of your own environmental goals.

Surveys

It isn't uncommon for protected species to crop up on construction projects. Bats are a particular hazard for new schemes, ponds might harbour newts, while badgers, owls and rare plants can appear anywhere on a site.

If you (or the council) believe there may be protected species or trees on your site, you'll need to conduct the appropriate inspections – such as ecology and tree surveys – to determine what is present. If something is detected, you'll need to put measures in place so your build doesn't cause harm.

Be aware that some assessments can only be undertaken at certain times of the year. Bat surveys are a prime example. They must be carried out during the active season (May to September), so discovering their presence on site in, say, October, could set your project back by six months or more. The requisite emergence survey also involves suitably qualified ecologists sitting around the plot at dawn and dusk with bat detectors, which tends to be quite an expensive process.



Left: Wallbarn's M-Tray modular green roof solution not only looks great, but is easy to install and achieves the highest possible fire rating for a roofing system (www.wallbarn.com)

Green roofs & living walls

Wildlife-friendly architectural features offer significant environmental and ecological benefits when incorporated into new home designs. These features involve covering roofs or walls with layers of luscious vegetation which can be installed using modular systems or built-in planters.

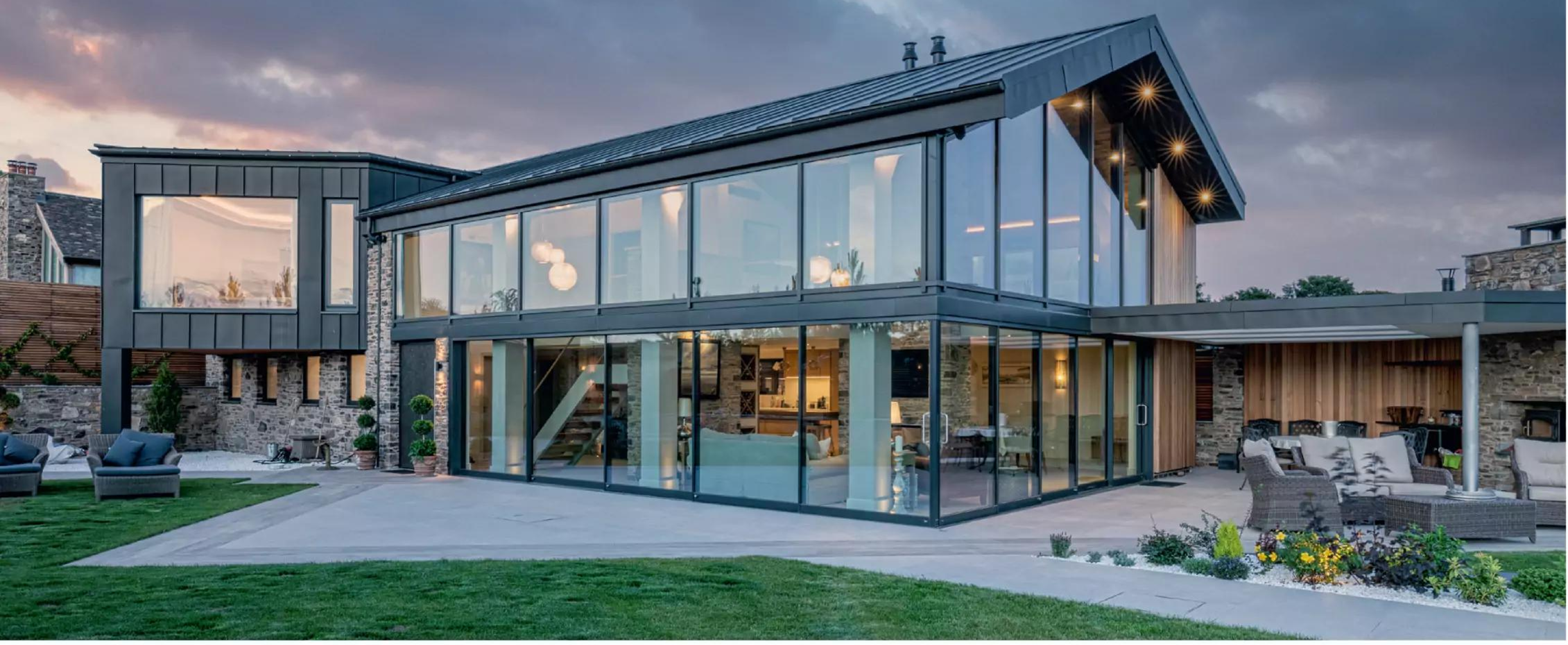
To install a green roof, a waterproof membrane, drainage layer, growing medium and suitable plants are incorporated. Living walls use vertical frameworks with an irrigation system to support the greenery. Both systems help insulate buildings, reduce water runoff and improve air quality. Most importantly, they enhance biodiversity by creating habitats for insects, birds and pollinators – especially in urban areas where green space is limited.

Improving the landscape

Incorporating wildlife-friendly features can greatly enhance biodiversity around a new home. Natural ponds create vital habitats for amphibians, dragonflies and aquatic plants, while also providing a water source for birds and visiting animals. Meadows planted with native wildflowers support pollinators such as bees and butterflies and require less maintenance than traditional lawns. Bat and bird boxes offer safe nesting and roosting sites while wooden insect hotels provide shelter for solitary bees, ladybirds and other insects that are essential for pollination and pest control.

Together, these simple features can dramatically transform your surrounding gardens into interconnected habitats, encouraging native species to make your home their own.

DESIGNING A SUCCESSFUL BARN CONVERSION



Architect **Opinder Liddar** explores how you can transform rustic, agricultural buildings into stunning homes, fit for modern living

Above: HSSP Architects converted this former barn into a contemporary residence in rural Leicestershire. The fabric of the original barn has been retained and the concrete walls remain in-situ, aside from on the principal elevation where floor-to-ceiling glazing helps to bring in sunlight and views (www.hssparchitects.co.uk)

You can create a beautiful dwelling through a barn conversion project and potentially save yourself the many hassles that come with trying to build your own rural home from scratch. These projects have always been popular, particularly as many can be converted via a simpler planning route through permitted development – Class Q, which enables you to create quite a sizeable home by utilising an existing structure. This article provides several tips to help you achieve a showstopping barn conversion project and what to look out for if you come across such an opportunity.

Planning permission

Usually, new development in the countryside or green belt areas is not allowed, so if your dream is to live in a rural setting, a barn conversion may be your most viable option. Rather than having to apply for full planning permission, you would still need to follow a prior approval process with the local planning authority as the building and proposal needs to pass these tests in order to gain consent.

This doesn't cover every barn. Bare in mind that agricultural structures within national landscapes, protected conservation areas or a listed building's curtilage will not fall under the easier planning route.

As long as your barn is not in any of the above, there are further legislative caveats that need to be achieved:

- The maximum size of the dwelling is 150m².
- If the barn is big enough, you could create up to 10 dwellings to a maximum of 1,000m². This is to encourage owners of these agricultural buildings to create more homes using under-utilised structures.
- Single-storey rear extensions are allowed up to 4m deep, so long as there is a hard surface already.
- There must be access to a public highway.
- The barn must have existed before 24 July 2023 and have been used only fon an agricultural basis for at least 10 years beforehand.

One interesting element of this is that green belt land is not mentioned, which would normally stop you from building any dwelling in this designation. It's also worth noting that you can, of course, apply for full planning permission if your project doesn't conform to Class Q.

Assess the existing building

Now that you are touring the countryside looking for these opportunities, here are some preliminary assessments you should make before committing to making an offer on a potential conversion:

- Take some basic dimensions of the internal space and ceiling heights when you visit.
- Examine what services and drainage systems are available on site already.
- Is there potential for solar panels or wind power?
- Are there any original features that can be used to maintain or enhance the character of the building?
- Check for any signs of damp or rot. It is vital that you have this investigated as soon as possible and get any recommendations on how to treat it.
- Are there any rights of way, such as bridleways, that will come near the barn? It is worth checking if these might affect your private amenity.
- Do you have access to all sides of the building? When it comes to construction, it will save time and money to have easy entry points for contractors.

TONY TIMMINGTON

Division of space

As with all building projects, you should create a detailed outline brief of what you are looking to achieve. You'll need to meet minimum space standards for rooms in the structure and I would recommend that you don't try and cram everything into the space you have.

Typically, these types of projects often have too much space and you need to make sure you create a home not a warehouse. Make the most of the scale of the building and incorporate double height spaces to living areas.

As the existing structure could be very large, you do need to break up this space to give character in these voluminous buildings. You don't need to follow the lines of the external walls so think about angled walls or curved walls to create drama within these spaces. If the floorplan is very spacious, consider incorporating level changes or using different finishes to help better define zones.

Structural Integrity

Permitted development will only be granted so long as the original structure is used, so it is a good idea to get this checked before you commit to buying a barn.

Usually, steel framed buildings are in good order but I have seen concrete framed structures where corrosion of reinforcement is evident, or some heavy machinery has damaged the structure. I've also worked with stone barns where walls are bulging or not vertical and needed partial rebuilding or strengthening to make them habitable.

Get a structural engineer to assess the building and take samples if needed to ensure that you can use the original structure. It is possible to insert new structural members to assist the original if this is needed, but this is going to add to your costs and project schedule.

The engineer should also check that the roof can carry the additional loading of thicker roof make-up compared to the single sheet material that is likely to be present now. If there are timber members, you should also assess for woodworm or rot as the structures would have been left unattended for many years and not maintained.

Natural light

In some barns, the depth of the building can exceed 11m. Getting natural light from just windows across this depth will be a tricky endeavour, so I would suggest that you look at introducing natural light from above using rooflights.

There are some deep barns that have had successful conversions by inserting large banks of sleek overhead glazing within the centre of the home's floorplan, creating a lightwell area to draw nautral light into the rooms below.

Additional floor levels

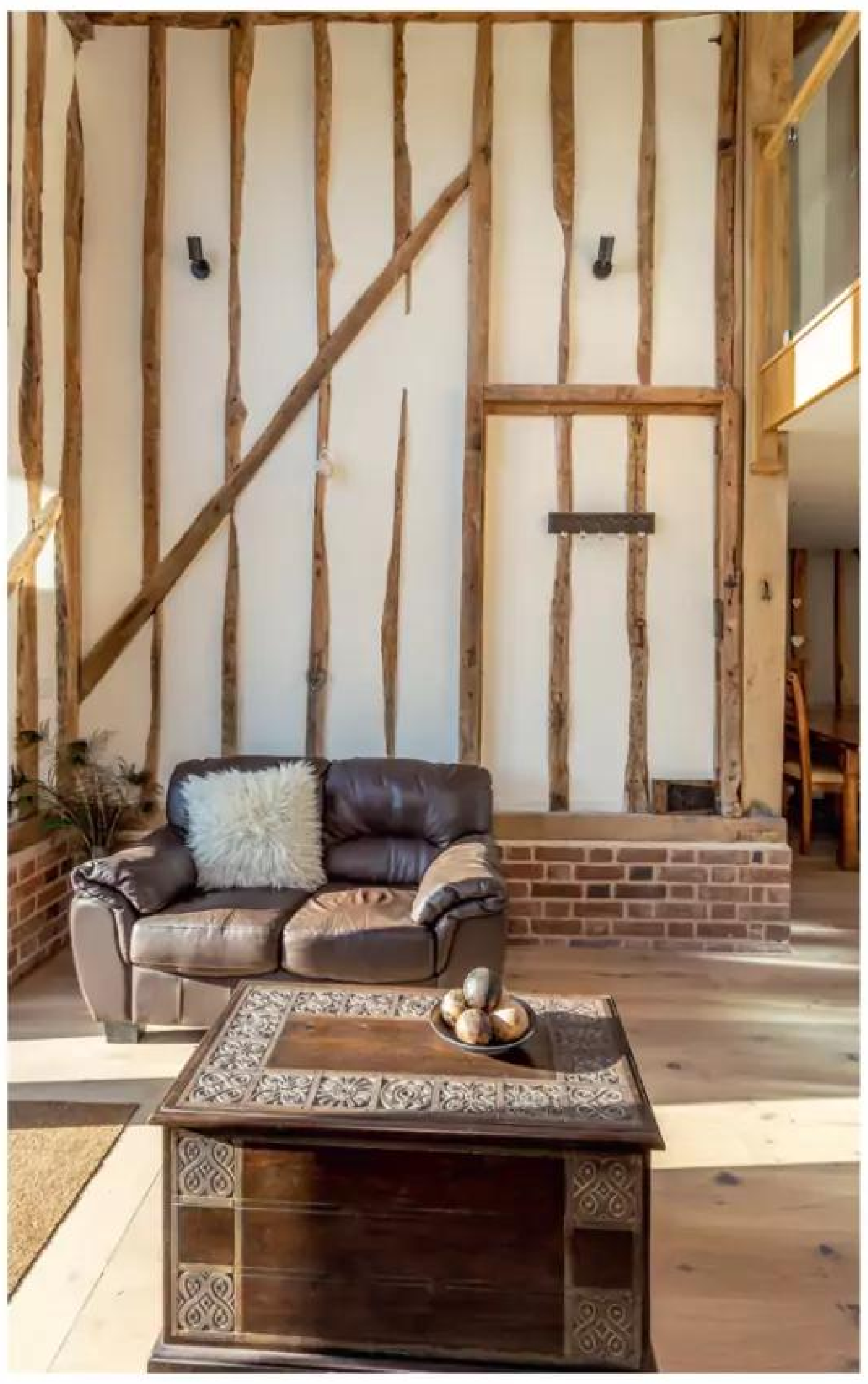
Usually, barns have quite high ceilings and it would make sense to use this volume to provide more accommodation. However, if you want to gain residential use through the Class Q permitted development route, the additional floor plan you create will count towards your 150m² limit. Therefore, you may want to think about adding this upper zone later, once the original conversion has been successfully completed.

If this is the case, then make sure that your architectural plans incorporate features such as large gable windows, rooflights or roof lanterns and drainage points. These would easily allow for a future floor installation without the need of having to carry out more external work.

Sustainability

As with any project, insulating the external envelope as much as you can and getting good levels of airtightness will be key in minimising your running costs in the long term and maximising your thermal comfort.

Class Q rules allow you to extend the external dimensions of the building by 200mm, so with some thought on detailing, you should be able to create excellent levels of insulation that would match or exceed those of a new dwelling. You'll need to provide SAP (Standard Assessment Procedure) calculations and an EPC (Energy Performance Certificate) for your conversion project in order to receive a completion certificate from building control.



Above: Although they had no prior experience of renovating, Build It readers Sam and Grant Risley took on the challenge of converting a 400-year-old barn with the help of local architect, Paul Scott. They chose to expose some of the barn's original structure to ensure the rural charm of the property remained intact

LYNDON DOUGLAS

Left: Martin and Fiona Jenkins transformed an atcost barn on their family farm in Essex into a contemporary home. The house's striking M-shaped roof was part of the original concrete frame while its new zinc finish gives it a modern aesthetic (www.arcady architects.co.uk)

PRIOR APPROVAL APPLICATIONS

As the permitted development route is considerably easier than the full planning route for a new dwelling, you do need make sure that your prior approval application is correct and properly prepared. Therefore, it may be a good idea to work with a professional to prepare this for you. You need to ensure the following is covered in your application:

- **Existing and proposed site layouts**
- **Existing and proposed plans and elevations**
- **Planning statement setting out why this falls under permitted development**

The council will have 56 days to make a decision and interestingly, if you don't hear anything from them, then it is deemed as approved. In addition, nobody else can object to this approval.

By going down this route, you will also save money and time from not having to employ an army of consultants to prepare reports on bats, trees, drainage, energy and carbon, for example. Compared to submitting a standard full planning application, this is a walk in the park and far quicker. If only all planning procedures worked like this these days!

However, you need to make sure the application is prepared properly so it's worth the investment in hiring a proper expert to do this.

If your barn is listed or built before 1940, there is a very good guidance document produced by Historic England titled Adapting Traditional Farm Buildings. It is well worth a read as it does demonstrate many good examples of conversions and how to go about them that will potentially give you a greater chance of a successful application.

NICHOLAS WORLEY

Right: This project in Yorkshire by Vine Architecture Studio, involved strengthening the centuries-old stone and brick structures from the main farmhouse and masonry barns and replacing the rotten timber-framed barns on the site (vinearchitecture.com)

In typical cases, you would apply a new external envelope to the outside of the structure so you can encapsulate this within the insulation. This will help avoid any protrusions or awkward junctions.

If the existing structure is too large, you could build an inner skin of walling so the existing oversails the new enclosure. If this is the case, you will need to provide foundations for the walls to sit on and ensure that any structural protrusions, especially steels, that run from inside to outside, are insulated to prevent cold bridging.

Cladding decisions

The existing structure is likely to have some cladding already present. Timber is most common but, you may also find metal or asbestos sheeting. Obviously, if it turns out to be asbestos, then you will have an expense in assessing and removing this dangerous material in a safe manner, as this type of work will need to be carried out by specialist contractors. Whatever material the cladding is, it is unlikely that it will provide much thermal resistance, so you need to think how to insulate the original building.

Where the outer walls are essentially a frame you can infill with new insulated timber framed wall units and clad them externally. Whilst you could clad them in any material, I think the materials should reflect an agricultural character, so timber or metal would work well here.

If you are considering metal rather than using a timber infill panel, you could use a metal insulated wall panel system like Kingspan Quadcore or Tata Steel products. These tend to be enclosed panels, rather than a layered system which would need to be ratified by building control as these systems will need to prove their fire rating performance. These layered panels might also not be acceptable with your insurers, so make sure to double check with them when you come to picking your system.

With a stone-walled barn, you can greatly improve the thermal performance of the building by adding an internal timber wall with insulation between the studs, and another layer to the inside of the structure.

A barn conversion project could just be your way of creating a characterful and efficient countryside home that would otherwise not get approved in such a location.

OPINDER LIDDAR

Opinder Liddar is a Build It Award-winning designer and a director at Lapd Architects. He specialises in self build homes and renovation projects, and is a regular expert at Build It Live. For more information about Lapd Architects call 01865 407722 or visit www.lapdarchitects.co.uk

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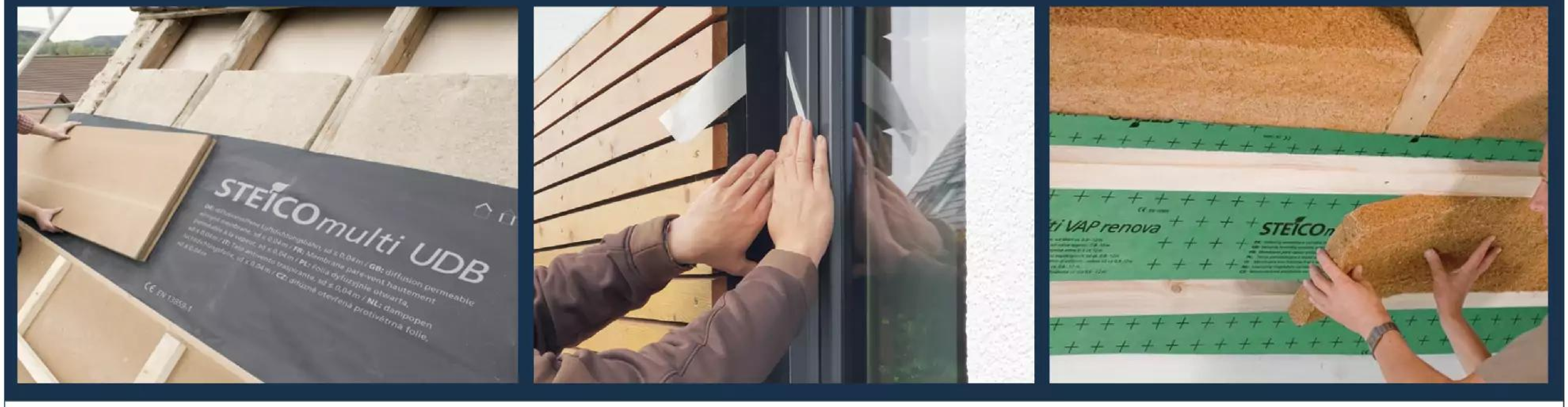

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UNDERSTANDING PLANNING CONDITIONS

Planning expert Martin Gaine investigates how to avoid, manage, remove and discharge important stipulations from the council

There is nothing quite like the feeling of being granted planning, especially if the process has been long and painful. But remember that almost all approvals come with conditions – sometimes a rather long list of them.

It is important to prepare for conditions as part of the application process. Unexpected terms will delay your build if you need to discharge them before you start construction and can derail it entirely if they place obligations on you that you weren't expecting and had not budgeted for.

Ignoring problematic stipulations can be tempting, but not a good idea – breaching a condition leaves you open to enforcement action, putting your whole development at risk.

In this article, I will explore what conditions are, why they matter, what you can do to avoid them in the first place and how you can discharge or remove them if you need to.

What are planning conditions?

Conditions are used by councils to clarify details that were not in your planning application (such as what bricks you will use), to control how works will be carried out (setting hours of construction) or to reduce harm (by requiring a window to be fitted with obscured glazing to stop overlooking your neighbours). They are not always a bad thing – they can solve a problem that might have led to a refusal.

There are a couple of standard terms that appear on almost all decision notices. The first gives you three years to start work (or else the permission expires). The second is known as approved plan conditions and lists the planning drawings that the council assessed in making its decision and requires that you build according to those exact plans.

Aside from these, there are then three main kinds of conditions: pre-commencement conditions (requiring you to make changes before works start); pre-occupation conditions (needing compliance before a build is occupied for the first time) and ongoing compliance conditions (which place a continuing obligation on you).

Of these, pre-commencement conditions are the most challenging because they require you to make amendments before the development starts. This can come as a shock to those with a team of builders on site ready to start work as soon as planning permission is granted.

Discharging conditions

Some council stipulations require you to provide additional details for approval, which you do by submitting a discharge of condition (also known as an approval of details) application.

The discharge of condition process is somewhat similar to conventional planning applications – you prepare the drawings or reports, fill out the relevant form (usually on the Planning Portal website) and submit to the council along with the appropriate fee.

Similarly to a planning application, a decision typically takes eight weeks and can, of course, be refused if the council isn't satisfied with what you submit. If refused, you can make a new submission and/or appeal against the council's decision.

Avoiding conditions

Too often, council stipulations can come as a bit of a surprise. It is best to pre-empt them by ensuring your planning application is as complete as possible, so that the council does not need to impose conditions requiring further information to be submitted. You can do this by checking the local council's policies to work out if they

GAVRIIL PAPADIOTIS

Below: Tin House, designed by Henning Stummel Architects, was built on an old breakers' yard. It was granted permission on the condition that any contamination was investigated and disposed of – a process that cost around £50,000 (henningstummelarchitects.com)

TOP 5 MOST COMMON PLANNING CONDITIONS

1 Materials Details of your choice of bricks, roof tiles, windows and other finishes. For a domestic extension, the condition might just require you to use materials that match the existing house. For a self build, you are likely to have to submit details (or even samples) of materials to the council for approval.

2 Hard & Soft Landscaping Confirmation of the trees/shrubs you will plant, as well as any paving and driveway plans.

3 Parking & Access Parking and turning areas, cycle storage.

4 Drainage Surface water or foul drainage details to highlight how your build will prevent flooding.

5 Working Hours Limits can be imposed on when noisy construction works can take place.

RICHARD GADSBY

Above: Build It reader Chris Desyllas brought Snug Architects on board to design a chic replacement dwelling. All the side windows have obscured glazing, as required by the council, which prevents direct sightlines to the neighbour's home (www.snugarchitects.co.uk)

have any requirements you weren't expecting, such as the need to provide information on sustainability measures, ecology or drainage.

You should also try and discuss any proposed amendments with the case officer before the decision is made, to see if they can be avoided, either by persuading them that the condition is not necessary or reasonable, or by providing the required information before the decision is made. You may be able to negotiate the wording of the condition to make it less onerous.

For self builds, it common for stipulations to be imposed requiring details of the choice of materials, the landscaping of the site and the design of enclosures for bicycles and bins, for example. You can avoid these conditions by providing the relevant details with your planning application.

Of course, this advice assumes that you're in a rush – if you aren't planning to build for a couple of years, you might prefer to have time to decide on the materials and be quite happy to discharge the condition later. If you're thinking of selling your site with permission, it makes sense to allow the new owner to decide on the finish.

Challenging unfair council conditions

The government's guidance is that conditions should be used sparingly and only imposed where they are reasonable and necessary for approval to be granted. As the planning system has become more complicated over the years, the number of conditions imposed on planning consents has grown and it's common for permission for just one house to be subject to a dozen or more conditions. This scattergun approach to conditions by local planning authorities, whereby they impose whatever restrictions they can think of, places an unfair burden on developers and delays development.

If you have been granted planning but don't agree with the council's stipulations, you can appeal against those conditions. You have to appeal within six months of the decision and they can take around six months to be decided. The disadvantage of appealing is that it technically reopens the whole planning application for consideration by the appeal inspector, with the risk that they could decide that further conditions are required or that planning permission shouldn't have been granted in the first place.

The safer approach, which I would recommend, is to leave your approval intact and make a new, separate application to remove or vary the wording of the problematic conditions (this is also known as a Section 73 application). If successful, then you have new planning permission for your project. If not, you can still fall back on your original consent.

Breaching conditions

It is very risky to ignore conditions that you don't like. If you start building work without first complying with a pre-commencement requirement, you haven't started in the eyes of the planning system. This means your permission will expire after three years, so your build is unlawful and at potential risk of enforcement action.

One of my clients obtained planning permission for a two-storey side extension to his house, subject to him submitting details of a gas resistant membrane that should be installed beneath the structure, because of concerns about gases migrating from a landfill site in the area. He employed a company to check for gas, was told there was none and so pressed on and built extension without the membrane. He was then served an enforcement notice demanding that the extension be demolished (an appeal against the notice is pending).

If you do breach a condition, it will become lawful after 10 years, as long as the local planning authority hasn't taken enforcement action. You can then apply for a lawful development certificate to confirm that the breach is lawful by virtue of this 10 year rule.

HOW TO AVOID UNNECESSARY CONDITIONS

The best way to deal with stipulations is to prevent them being imposed in the first place. You can't avoid all of them, but you can minimise them. Here are my top tips:

- **Engage early with planners.** At pre-application stage, ask the planning officer what information they'll need.
- **Provide enough detail in your application.** The more information you submit up front – such as material choices, landscaping or technical reports – the fewer conditions the council will feel necessary to impose.
- **Negotiate wording.** If draft conditions look excessive, you or your agent can suggest alternatives.
- **Appeal if unreasonable.** If you believe a stipulation is unnecessary or unfair, you can appeal to the planning inspectorate or you can apply to vary or remove the condition.
- **Never ignore a condition.** Breaches of condition are taken very seriously by the local planning authorities and can trigger enforcement action.

MARTIN GAINE

Martin Gaine runs planning consultancy Just Planning (www.just-planning.co.uk). A former case officer, he has experience on both sides of the planning divide and now specialises in helping homeowners win consent at appeal. He is the author of How to Get Planning Permission: An Insider's Secrets.

Eco-friendly bricks

Could low-carbon bricks and blocks be contenders for a sustainable self build? **Nigel Griffiths** investigates the innovative options entering the market

CHRISTINA HANCOCK

Above: Scottish innovation K-Briq (in Medero Dark Grey) was used to create an interior feature wall in this stylish rear extension project designed by Whittaker Parsons – saving 300kg of embodied CO2 versus using conventional bricks. K-Briq can also be used as an external facing brick

With every update to Building Regulations, newly constructed homes become ever more efficient in use. We eco builders are therefore now more focused on the energy required to build new houses – in other words, the embodied carbon emissions arising from the manufacture and installation of materials. This affects many of the big-ticket items we install in our homes, such as insulation, windows, roof coverings and floor constructions. But there's one set of products that stands out as having a particularly high environmental impact: bricks and blocks. So, what are the options to reduce embodied energy in a brick build?

What makes bricks high carbon?

Cavity wall construction has three main components: an outer skin to keep the weather out; insulation; and an inner load-bearing skin (supporting the upper floors and roof). Depending on their specification, bricks or blocks can be used in either of these skins.

Conventional bricks are made from clay and fired at high temperatures to make them hard and weatherproof (although the material can also be used unfired). Clay is plentiful and extracting it does little damage to the environment. But it takes a large amount of energy to get a kiln to over 1,000°C, and it's this process that gives brick such a high embodied energy/carbon. It also takes energy to extract and process the raw material (the clay). Composite bricks are also traditionally high in embodied energy. A key factor is that most of them use cement as a binder to hold the aggregates (sand, crushed stone, concrete etc) together.

The are several approaches that can reduce the embodied energy present in bricks and blocks:

Clay bricks:
- Reduce the temperature at which clay blocks need to be fired by adding other materials to the mix.

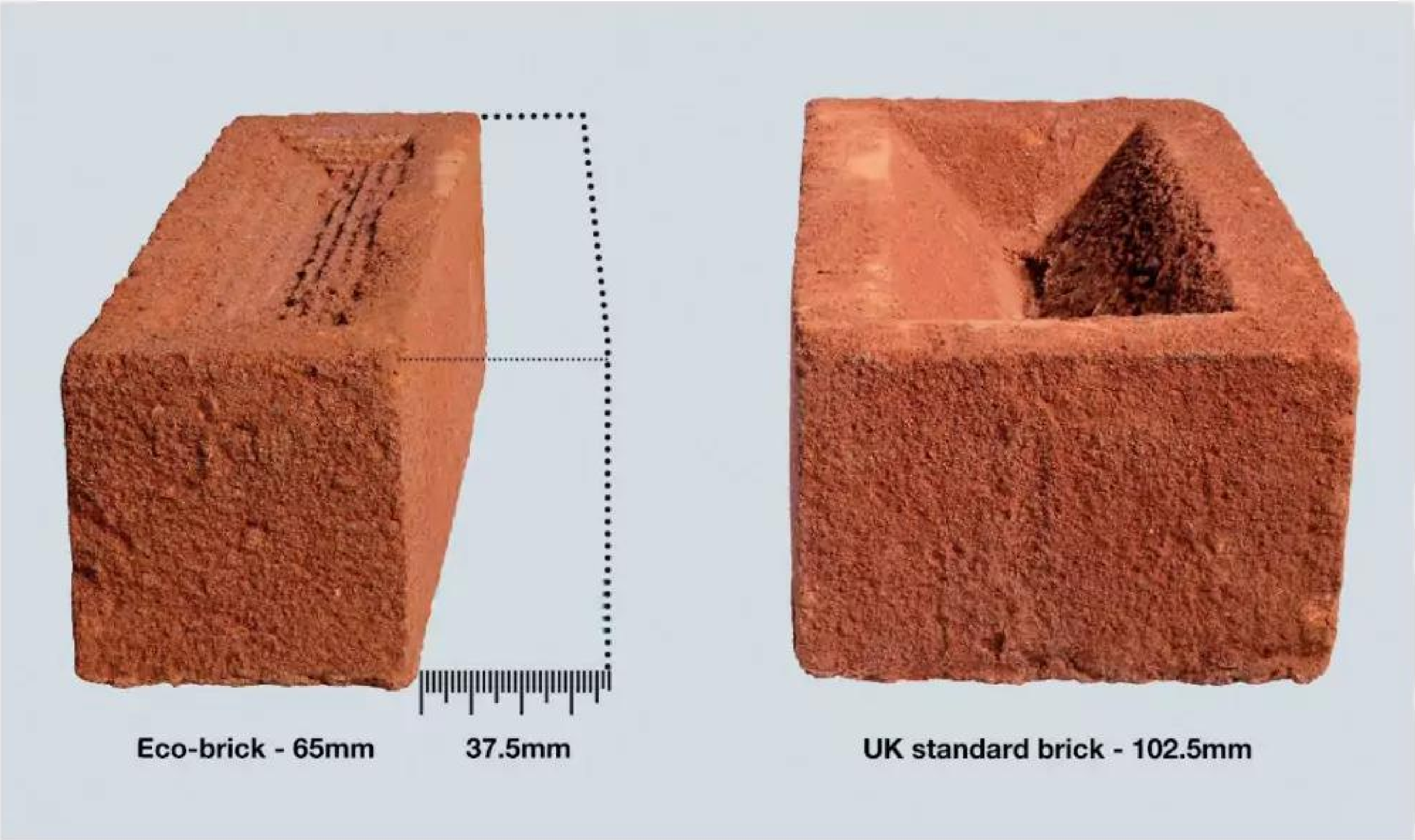
Composite bricks:
- Cut down the carbon intensity of the binder used to glue the aggregates together (usually, but not always, cement).
- Minimise the embodied energy of the aggregates by using waste products (such as crushed, recycled masonry).

Before we dig deeper, it's worth mentioning that embodied energy is a large part of the sustainability story – but not the whole story. Some natural materials also have the capacity to absorb pollutants, for example, delivering a healthier living environment – whereas less eco-friendly materials actually contribute to indoor air pollution. If your project needs to meet Building Regulations and you're looking to use innovative products, always be sure they hold the right certifications (see box, overleaf).

Fired clay bricks

Since cavity wall construction was introduced in the early 20th century, clay bricks have been the first choice for the outer skin (facing bricks). The load-bearing inner skin is normally constructed from composite or insulated blocks. Most of the UK's housing stock is built this way.

Some brickmakers have worked to improve the firing process, reducing the energy required and emissions generated. One way to achieve this is to reduce the amount of clay that's to be fired, such as by adding aggregates and



Right: For its Eco-Brick, Wienerberger has taken the simple approach of making fired clay facing bricks in a slimmer profile – thus reducing embodied carbon by 30%, requiring less mortar to lay, and allowing for more insulation within the same overall wall thickness other materials to the mix. Cleaner fuels, such as hydrogen or biomethane, can also be used in the firing process. Kiln heat recovery and use of recycled water can help to bring down the embodied energy of fired clay bricks, too.

Unfired clay bricks

We've been using clay since humankind first built mud huts – and similar unfired bricks and blocks are still in use today in many parts of the world. Closer to home, cob blocks are often specified to repair old buildings, especially in Devon, where cob construction was common up until the 18th century. Cob is made from raw clay (often containing other minerals) with straw added to the mix for tensile strength. The exact mix varies according to where you are and what kind of clay is available.

Unfired clay products do, of course, require protection from the elements. They are not suitable as an external skin on their own. Most cob buildings, for instance, were coated with lime-based render. Properly-maintained, this most eco-friendly of materials can last indefinitely – but it's important to note that without good upkeep, unfired clay walls will decay much more quickly than fired brick.

Most commercially-available unfired clay blocks are used for non-load bearing purposes only – although there are some products marketed for structural use, including the likes of H G Matthews' Strocks (a compressed brick of clay-rich earth and chopped straw).

Sand-based blocks

One enterprising brickmaker – Belgian firm Lowie – has developed a new type of brick that sets hard without any firing. This is made from fine sands, held together with a binder created using byproducts of the steel industry – a great use of waste material. Its strength is achieved through an innovative production method, compressing and vibrating the material before natural carbonation then completes the hardening process. The company claims a 76% reduction in carbon emissions in comparison to conventional fired clay bricks. While it's currently made in Belgium, it is certified for use in the UK for both internal load-bearing skins and externally as a facing brick.

Monolithic brick

There's another approach to wall construction we should bear in mind, as it reduces embodied energy through a different methodology. Monolithic fired clay blocks – such as Porotherm and Juwo Evolved SmartWall – deliver a watertight, load-bearing and (often) pre-insulated wall construction with just one component.

They are normally finished externally with render or brick slips, and internally with a smooth board – ideally using vapour permeable materials to maximise thermal buffering within the walls. This preserves a more even internal climate, with fewer peaks and troughs of temperature. Compared to conventional cavity wall construction, the combination of aerated clay blocks and thin-joint adhesive (rather than cement mortar) offers advantages in terms of speed and simplicity, all of which reduces environmental impact.

Above: Lowie's range of facing bricks is available in a range of white and grey hues, offering the look and warmth of clay while slashing embodied energy

A NOTE ON STONE

You might not be expecting to hear this, but stone is potentially the most eco-friendly of all wall building materials. It requires no firing, as all the work to make the material hardy was done thousands of years ago by processes lost in the mists of time. It's also highly durable: stone generally lasts longer than fired clay bricks and, importantly, can be (and often has been) reused many times. Unfortunately, stone is simply not available in many places, so we've had to rely on other materials for construction.

Composite bricks & blocks

This type of masonry is made from aggregates, which are bound together and shaped in a mould. The most common binder is cement, resulting in the concrete building blocks with which most builders are familiar.

The cement industry has been taking steps in recent years to cut the carbon intensity of cement, mainly through the use of cleaner energy to manufacture the cement. Some composite brick and block makers have also found ways to reduce the cement content of their products, thus reducing the overall embodied energy.

Even greater reductions can be achieved through the use of lime as a binder. While it does require energy to produce, lime absorbs CO2 as it cures, so blocks made this way have a far lower embodied carbon. Lime is commonly used as a binder in other sustainable building products such as hempcrete and woodcrete blocks. These products use renewable, lightweight aggregates that also lock in (sequester) CO2 for the lifetime of the building.

Excitingly, a recent market entrant – Kenoteq – has found a way to produce low-carbon composite facing

Below left: Juwo Evolved SmartWall is a fired clay block system that can deliver excellent thermal and acoustic insulation in a single-skin, monolithic system – enabling a swift route to create a low-energy building envelope

CERTIFICATION OF ECO-FRIENDLY BRICKS

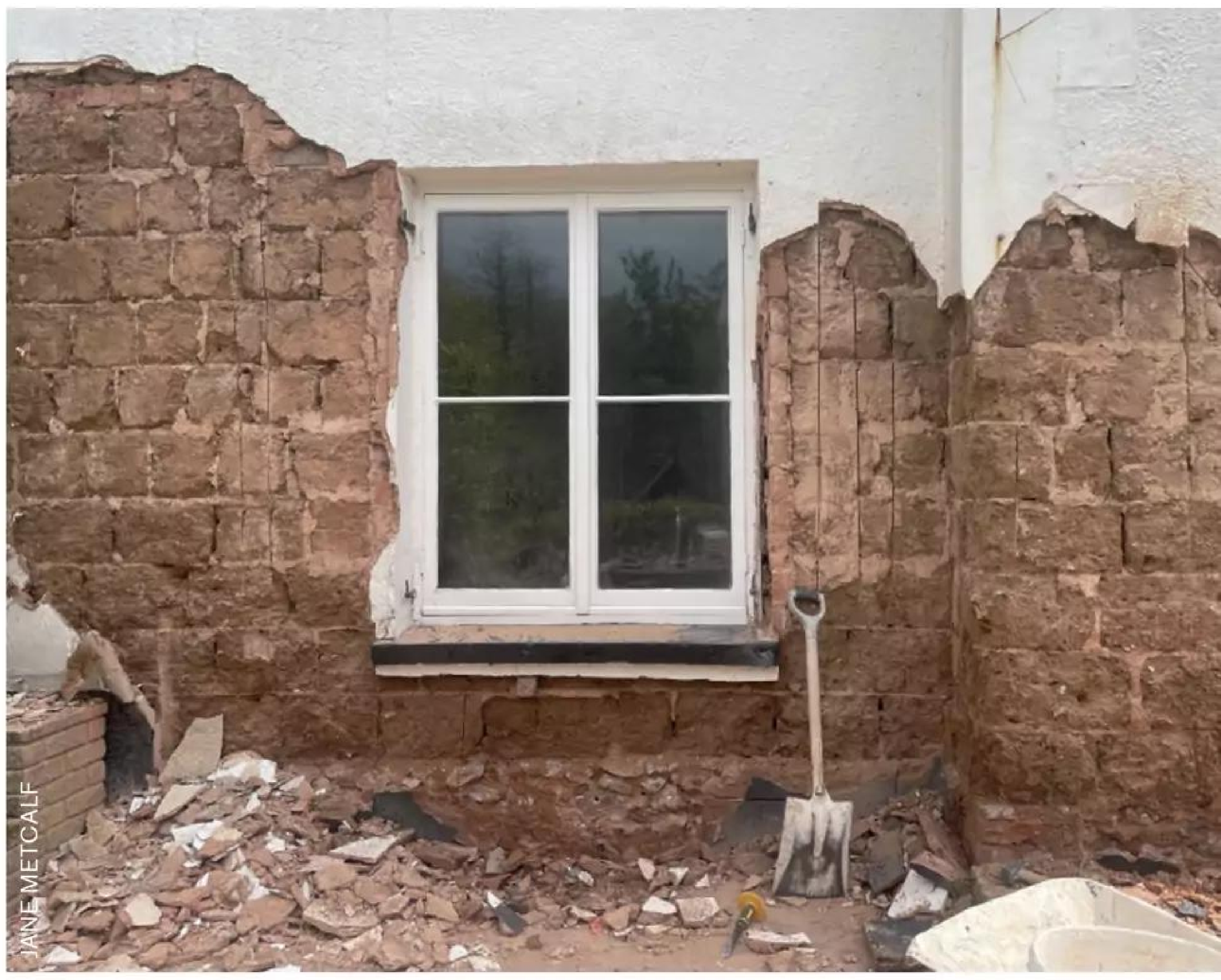
If you're tackling a self build, extension or major renovation, your project will almost certainly need Building Regulations approval. It's also a good idea to obtain a guarantee on your newly built or altered home, via a warranty from the likes of LABC, Self-Build Zone or Protek. This means you'll need to ensure all materials used in your building are acceptable to building control and the warranty provider.

Certification is the most secure route to achieving this. But it can be something of a minefield, especially if products are manufactured abroad and approved under European or other international certification systems. What's more, we're at a stage of innovation in the industry. So, you'll find that while some products are already fully certified, others – including some mentioned in this article – are still in the development phase.

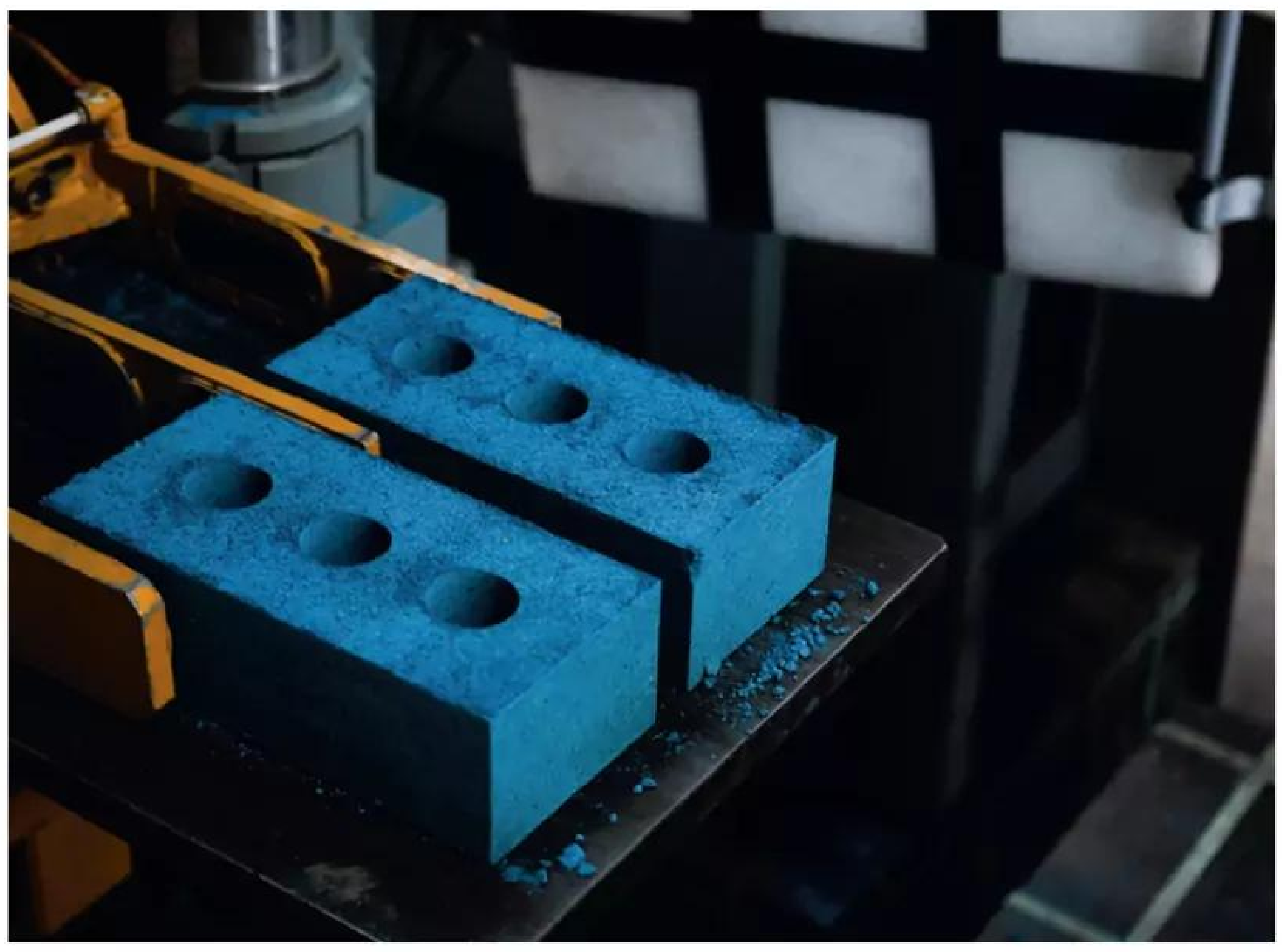
The best way to keep your building inspector happy is to use products that hold BBA (British Board of Agrement) certification. Its logo should appear on the documentation for the materials you plan to use. The corresponding certificate should also relate to how you're using the product in your project.

CE marking also applies to building products. This label confirms that the relevant manufacturer complies with the conditions set out within the EU Construction Products Regulation 2013. Post-Brexit, this has become the UKCA mark on our shores, although CE is still acceptable in some circumstances. It sets the minimum legal requirements for a product to be marketed.

The original CE mark set out several categories of environmental performance, including Basic Requirements for Construction Works (BRCW) No. 7: Sustainable use of natural resources. However, this element has not yet been fully operationalised in most product standards. So, if you want to put more scrutiny on the sustainable use of natural resources in your project, be sure to investigate the underlying Environmental Product Declarations (EPDs) or refer to the BBA Environmental Assessments, which are sometimes issued alongside the main BBA Certificate.


JANE METCALF

Above right: Cob block has a centuries-long history in UK construction, but it must be used alongside the right (breathable) materials – at this property in Sidmouth, Devon, an original wall is uncovered beneath an inappropriate cement render


Right: K-Briq is produced using nearly 100% recycled construction and demolition waste, and is hydraulically compressed rather than kiln-fired. It's available through builders' merchants and is now also stocked by B&Q

bricks. This is a great challenge, as facing bricks need to be weatherproof. The company's K-Briq product is BBA certified – so will be acceptable to building control – and is designed to deliver 90% carbon savings against conventional facing bricks by using recycled aggregates and no cement or lime. Instead, it features a secretive proprietary binder which the company says is non-toxic, and uses a compression technique to form the bricks.

In effect, this is the holy grail of brick production: providing a market for demolition waste; no firing; and super low-energy binders. K-Briq is also recyclable at end of use, so we can assume the toxicity of the binder is indeed low – the Environmental Product Declaration (EPD), due in early 2026, will confirm this.

Recycled plastic bricks

From time-to-time, I am alerted to the fact that a wonderful new product has become available, made from some sort of recycled plastic – anything from jewellery to art to bricks. However, it's by no means clear to me that this is good for the environment; in fact, it requires careful consideration.

When it comes to building materials, recycled plastic is sometimes used as an aggregate to replace stone or other fillers. This requires the use of some sort of binder to form the bricks or blocks. Mixing such different materials together and binding them makes it very hard to then recycle them at the end of their life. In my book, it's therefore very likely that these products will end up in landfill, or worse, escape into the wider environment.

Plastic is a very persistent pollutant. Many single-use items can last 500 years, if they ever break down at all, and future archaeologists may well refer to the present as the late plastic age. I believe what we really need to do is to stop producing non-biodegradable plastic, period. Then we need to focus on the clean-up, which means destroying this material by controlled incineration to prevent it from ever again entering our environment. Recycling essentially pushes the plastic problem further down the road, leaving it for future generations to clean up.

I hear the sharp intake of breath when I say that I don't believe recycled plastic is always a good idea. But think about it. Perhaps there is a reason why the plastics industry pays lip service to recycling with marketing messages such as "30% of this material comes from recycled plastic." Ultimately, this allows them to go on cheaply producing the other 70%, much of which will end up as pollution.

CONTACTS

British Board of Agrement www.bbacerts.co.uk **Juwo** 080 8254 0500 www.juwo-smartwall.co.uk **Kenoteq** 0131 605 0409 www.kenoteq.com **LABC Warranty** 0800 183 1755 www.labcwarranty.co.uk **HG Matthews** 01494 758212 www.hgmatthews.com **Lowie** 020 8713 1297 www.lowiebricksuk.com **Protek** 0333 456 5040 www.protekwarranty.co.uk **Self-Build Zone** 0345 230 9874 www.selfbuildzone.com **Wienerberger** 0161 768 7085 www.wienerberger.co.uk

NIGEL GRIFFITHS

Nigel Griffiths specialises in sustainable construction and eco-renovation and is the author of the Haynes Eco House Manual. He advises UK government on retrofit programmes and inspects renewable heat installations on behalf of Ofgem. You can chat to Nigel at the Build It Live shows.

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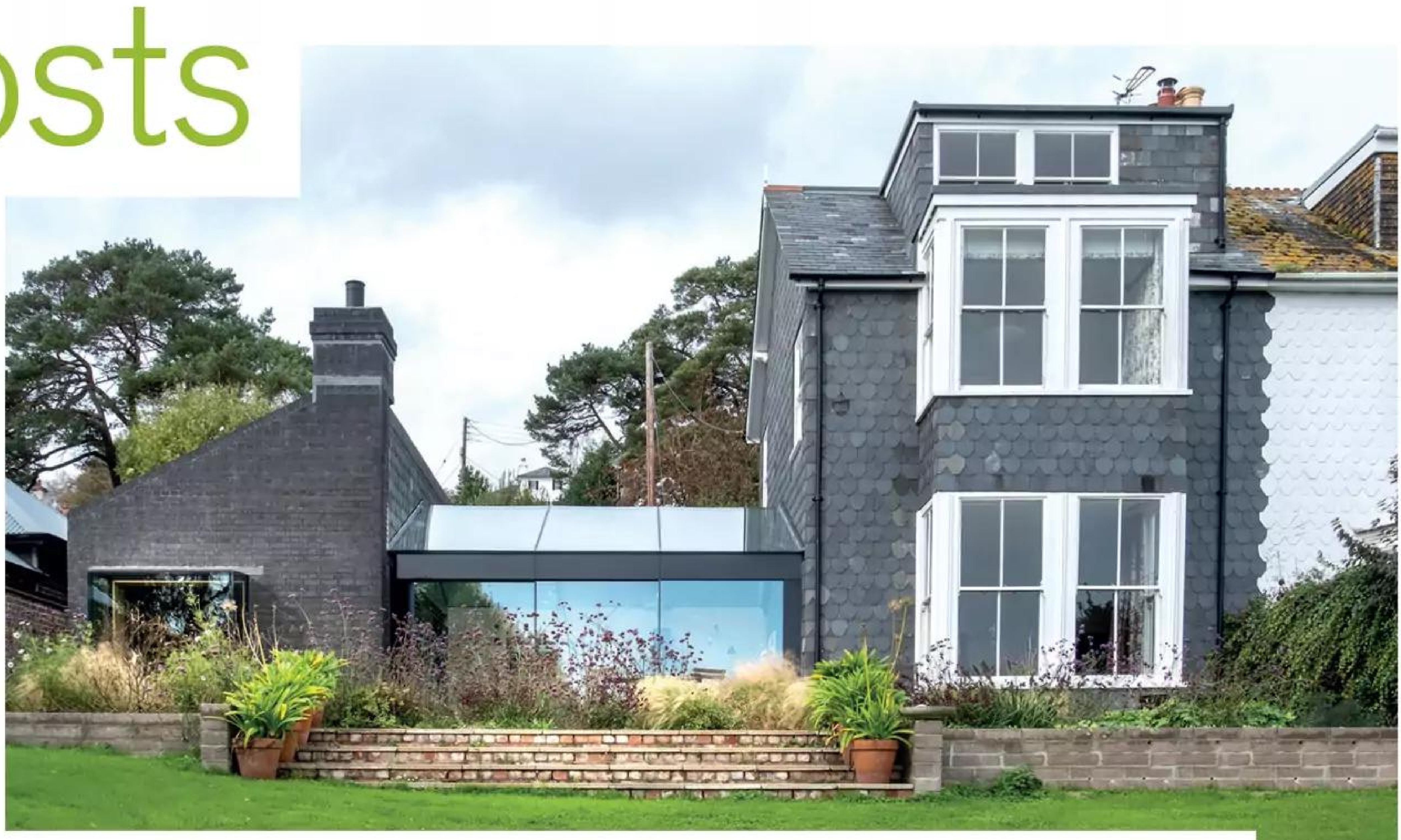
External wall insulation options & costs

Installing an exterior insulation system to a solid wall property can improve both its energy efficiency and the facade all in one go. **Lindsay Blair** looks at the key considerations and material choices available



INSTALLATION

Right: Winner of the 2024 Build It Award for Best Architect or Designer for a Renovation Project, this stunning refurb and extension project by RAK Architecture saw sheep's wool retrofitted beneath slate tiles on the existing part of the building – boosting performance and aesthetics

Topping up insulation is a great way to reduce heat demand and lower your energy bills – and the walls are one of the most obvious places to upgrade. While cavity walling has become commonplace, and can be retrofitted with blown-in or injected insulation, older or solid-wall houses require either internal or external insulation. Here, we focus on the latter.

External wall insulation pros & cons

There's a wide choice of EWI systems, from rigid insulation boards through to mineral wool-based options and natural alternatives, such as cork and wood fibre. Once fitted, the exterior can be finished with render (lime and silicone are popular choices), cladding or brick slips, enabling you to boost both kerb appeal and energy performance.

"EWI dramatically reduces heat loss, creating warmer, more efficient living spaces," says Paul Christmas, head of technical and training at EWI Store. Another advantage is minimal disruption indoors during installation, plus a saving on floor space – but it's worth remembering EWI does add to total wall thickness, potentially up to 100mm.

This can have knock-on impacts. "Retrofitting a period property can bring restraints in terms of existing rooflines and architectural details," says Paul. "You may need to extend the eaves or adapt features to accommodate EWI." Damp-proof courses, pipework and the like should also be reviewed to avoid the risk of moisture bridging.

Ventilation must be carefully managed and systems properly installed to prevent damp problems further down the line – particularly in solid wall properties built pre-1920. These were typically constructed using breathable materials, such as brick, earth, stone, timber and lime, that allowed moisture to wick out of the building fabric. Your project must preserve these vapour-open characteristics.

Installation timeframes can vary depending on the size and complexity of the project, as well as site conditions, weather and the level of prep required. The wall substrate may need repair and/or priming, while windows, doors, drains and expensive landscaping features should all be protected. For a typical residential property, the full EWI installation process from preparation to final finish usually takes around three weeks.

Understanding the pros and cons of each EWI type is crucial in making informed, effective decisions. Note many products are sold as complete systems including the insulation, membranes and exterior finishes – and some companies offer complete design, supply and install services. Here's an overview of the main choices:

NEED TO KNOW

Good design and installation is vital for any retrofit insulation measure, but particularly EWI. Adding the wrong insulation (or the right one incorrectly) can trap moisture and reduce airflow, which could lead to a build-up of condensation and mould.

This very issue has made the headlines in recent months, linked to poor-quality installs under the government's ECO incentive and the Greater British Insulation Scheme. A lot of these problems stem from bad workmanship by inexperienced trades – potentially enabled by a lack of oversight within the schemes.

The key takeaway is to ensure a quality install by vetted trades who understand the technical requirements and implications of different insulation systems. Many EWI suppliers have teams of in-house installers or can recommend registered local contractors. Or, if you're sourcing the labour yourself, look for specialists signed up to industry trade bodies such as INCA.

Rigid insulations

Rigid plastic products are frequently specified as they offer a strong balance of affordability and efficiency. "EPS (expanded polystyrene) is the most cost-effective, while phenolic has the highest thermal performance, meaning thinner insulation layers are required," says Gavin Creech, product manager at K Systems. "However, this type of insulation should only be used in lower risk buildings."

PIR (polyisocyanurate) is a similar alternative. "I find it's the most commonly used," says Rob Pollard, architect and director at RX Architects. "It is available in a wide range of sizes, thicknesses and form well-known brands such as Celotex, Ecotherm and Kingspan."

Rigid systems' impressive insulating qualities mean that they can be specified in slimmer profiles than the alternatives. "PIR is manufactured using a combination of chemicals, including liquid polyol and a blowing agent, which react to form a strong, lightweight and thermally efficient board," explains Rob.

But there's a snag: these products aren't vapour open, so may not suit older properties. Their manufacture also involves a higher carbon footprint than more natural products, so they're best reserved for projects where heritage and breathability aren't concerns, and where their thin-profile performance outweighs other factors.

Mineral wool

Fire-resistant, breathable and offering very good sound absorption, mineral wool is made from molten rock, glass or industrial slag that is spun into fine fibres.

It sits somewhere in the middle in terms of performance – not as insulating as the rigid plastics, but slightly better than the natural products outlined below. This makes it a strong choice for many homes, including those where vapour movement is important.

"Combining mineral wool with a lime-based render offers breathability and flexibility, maintaining a building's moisture balance while improving thermal performance – so it's often a good solution for retrofit projects," says Paul. Lime finishes are also ideal for preserving the character and detailing of heritage facades.

Natural options

For those seeking a truly sustainable EWI system, look to natural options like wood fibre and cork. Suppliers include the likes of Lime Green, Mike Wye and Ty Mawr Lime.

Made from timber industry byproducts, wood fibre insulation is breathable, recyclable and can help even out internal temperatures thanks to their heat-buffering thermal mass – so it's a premier choice for older homes.

Cork board insulation is a natural, renewable product made from the bark of cork oak trees (which regrows every nine years). It offers good thermal and acoustic properties, plus it's vapour permeable and recyclable.

With the right detailing, options like sheep's wool insulation can also be used. Bear in mind, however, that there are currently no certified all-in-one systems using this product, so you'll need specialist design.

"Natural materials generally have a higher thermal conductivity than synthetic options, meaning thicker layers are required to achieve comparable insulation values," says Rob. In turn, this means deeper walls and potential additional remedial works around roof eaves, window reveals etc. Price-wise, these materials (and the required labour) currently sit at the higher end of the scale.

Above: K Systems' E EPS external wall insulation was chosen to enhance the efficiency and aesthetic of this pair of semi-detached homes in Essex. The finish is TC silicone thin coat render

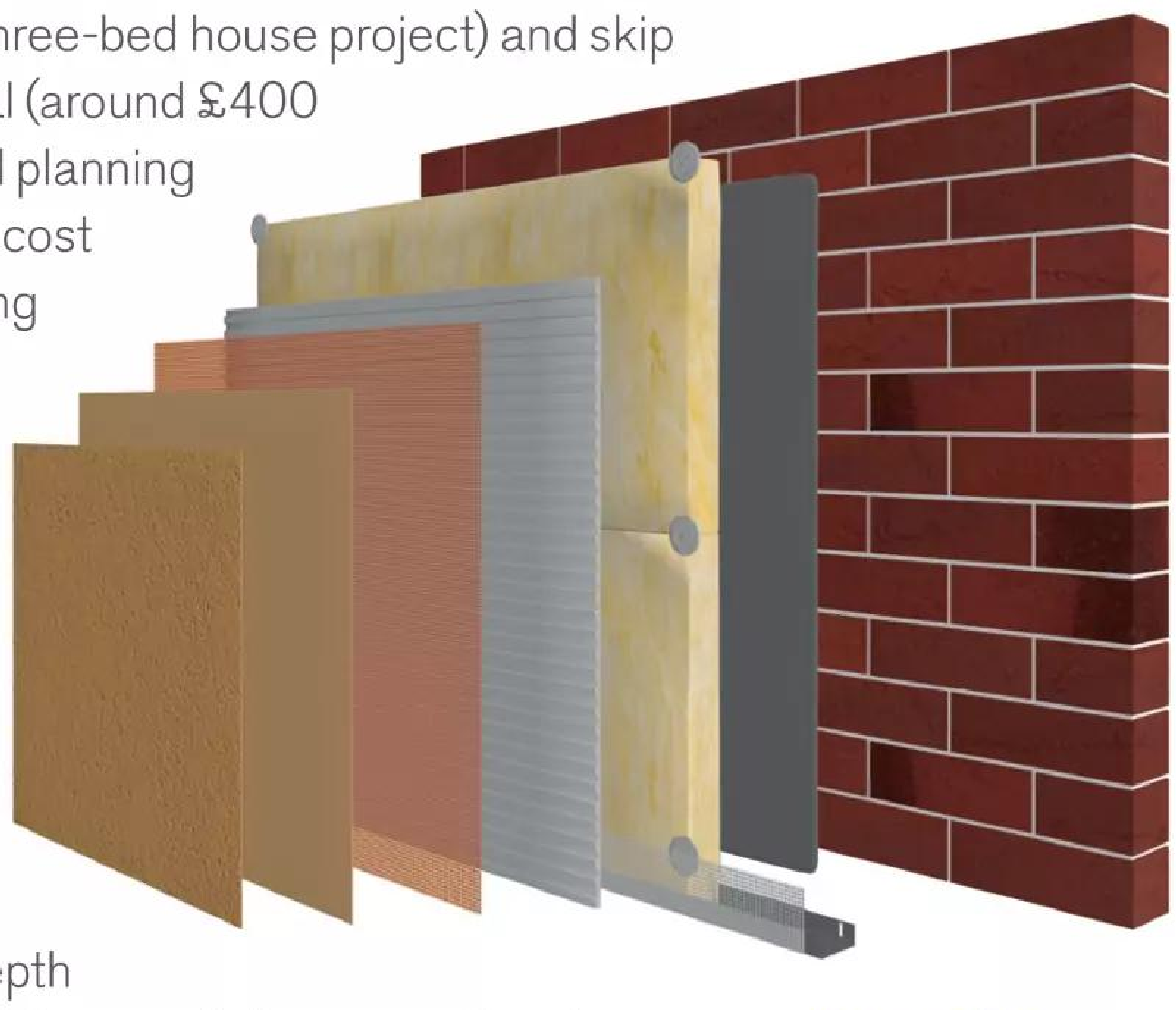
What does EWI cost?

According to the Energy Saving Trust, installing EWI costs around £18,000 for a typical three-bedroom, semi-detached house – with average savings of around £330 per year. In terms of the insulation itself, EPS sits at around £10 per m^2, PIR at £15-£25 and mineral wool £20-25 per m^2, while more premium, natural or specialist materials can reach £40-50 plus per m^2.

Of course, every project is different. "Variations in building size, structure and condition mean that each installation requires a tailored approach," says Paul. Further essentials to factor in include scaffolding (around £2,500 for a typical three-bed house project) and skip hire for waste disposal (around £400 per week). If you need planning for the works, this will cost £528 plus the Planning Portal admin fee.

Other hidden costs might include alterations to the roofline, guttering extensions or changes to fenestration to accommodate the insulation type and depth – although, if you're taking on a fuller renovation, these might be part of a wider package of works. "Much of this can be identified and planned for through a thorough site assessment and detailed specification," says Paul.

Then there's the choice of render or cladding. Many EWI suppliers offer packages including the insulation, installation and finishes, but always request a full breakdown of costs to be clear on what to expect.



Above: This illustration shows a typical build-up of EWI Store's mineral wool external insulation and render system – featuring a basecoat, Rockwool slab insulation and fixings, fibreglass mesh, topcoat primer and silicone render

CONTACTS **EWI Store** 020 3397 4067 www.ewistore.co.uk **INCA** 0330 124 6585 www.inca-ltd.org.uk **K Systems** 01744 353005 www.k.systems **Lime Green** 0800 538 5748 www.limegreen.co.uk **Mike Wye Associates** 01409 281644 www.mikewye.co.uk **RAK Architecture** 01305 246741 www.rakarchitecture.co.uk **Rockwool** 01656 868 400 www.rockwool.com **RX Architects** 01797 217220 www.rxarchitects.com **Ty Mawr Lime** 01874 611350 www.lime.org.uk

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PLANNING
Julia Riddle is a planning consultant with over 15 years' experience in advising on self builds and other types of residential development. She runs Castle Planning (www.castleplanning.uk) and has been involved in writing guidance on custom and self build to inform the national planning approach.

FINANCE
Tom McSherry has worked in the financial services industry for 25 years, the last 10 of these at BuildStore (www.buildstore.co.uk). He has undertaken two major projects himself and speaks at self build shows throughout the year.

SUSTAINABILITY
Nigel Griffiths specialises in sustainable construction and eco-renovation and was the author of the Haynes Eco House Manual. He advises UK government on retrofit programmes and inspects renewable heat installations on behalf of Ofgem. You can chat to Nigel at the Build It Live shows.

BUILDING REGULATIONS
Julian Owen is an East Midlands-based chartered architect and author of several books on self build and house alterations. His publications include Self Build, Home Extension Design and Kit and Modern Timber Frame Homes. He's also the founder of the ASBA Architects network. To find out more visit www.asba-architects.org.

PROJECT MANAGEMENT
Mark Stevenson has worked as a construction professional for over 35 years and is a serial self builder. He runs project management consultancy Elsworth Projects and, as chair of NaCSBA, advocates for the interests of self builders and contributes to the success of the emerging custom build industry.

DESIGN
Opinder Liddar is a director at Lapd Architects (www.lapdarchitects.co.uk). The practice specialises in residential projects from extensions to new builds, making him the ideal person to answer all your home design questions.

VAT RECLAIMS
Andrew Jones has worked within the construction industry for almost 40 years. With 15 years of experience processing DIY VAT reclaims (www.vat431.co.uk), he provides invaluable insight and opinion for self builders.

DESIGN

Do I need permission for my loft conversion and rear extension?

I'm looking to extend my home with a hip-to-gable loft conversion, a dormer extension and a ground floor addition. I believe under permitted development rules, my extensions to the house must not exceed 50m³.

My question is whether or not the ground floor extension's volume needs to be accounted for in this total m³ figure? The planned hip-to-gable and dormer addition come out at just under 50m³. Is it true that anything above the eaves level would be considered roof space, and is therefore classed as a separate extension project?

I assume that yours is a detached dwelling to qualify for the 50m³ allowance. This applies to the roof level and subsequent enlargements. So, providing your ground floor extension does not rise above the original eaves level or connect to the main roof, then this total volume will not apply to the ground floor extension, as this is subject to different parameters.

Your calculations would suggest that your scheme would indeed qualify for permitted development. In this case, and on the basis that this is a detached dwelling, you can extend to the rear by up to 4m from the original rear wall.

Whilst your extension project may not require formal planning permission, I would still suggest that you apply for a certificate of lawfulness from your local authority, so that you have proof you did not require planning approval at the time. This will be useful should you come to sell your property.

AGNES SANVITO

Build It readers Nicky and Gemma Kirk's 1930s property has been upgraded with a rear extension and dormer loft extension, featuring a master suite and bathroom **(self-build.co.uk/kirk)**

BUILDING REGULATIONS

Why do I need a principal designer?

I work in construction design and management (CDM) and am currently developing a project with a homeowner who is taking on a lot of the build themselves, with only a handful of specialist trades to help.

Despite almost 60 years of shared experience between myself and the homeowner, we are still unsure how the role of a Building Regulations principal designer works for homeowners, what the precise and relevant guidelines are and what they mean in practice.

Self builders and renovators are required to appoint a principal designer wherever there's more than one designer involved (if there's just one, then they become the principal designer). The term refers to anyone who plans any part of the building work – including structural engineers. If there are multiple contributors to the design and nobody is appointed in the role, the person commissioning the work is deemed to have taken on this responsibility.

Before a designer is appointed, they must accept the role and agree to sign off the job once it is completed. And, before a building inspector can issue a completion certificate, the project must be signed off by the client, principal designer and principal contractor. Sometimes the project's builder can take on the principal designer duty, but often they don't want to do this.

Initially, many architects were reluctant to sign if they have had no role on site, but the guidance has made it clear that they are only signing off the design, not changes made to the building work during construction. These new rules are why many building inspectors, who previously used to give informal advice on how to pass the regulations to architects and builders, now refuse to do so.

Issues can arise if either the builder or architect refuses to sign off the job due to unrelated disputes with their client, such as fee disagreements, for example. I have no direct experience of this happening, but the lack of a completion certificate from the building inspector would prevent a self builder from occupying the house.

DAN GLASSER

Fiona and Martin Lamb reconstructed the rear of their neo-Georgian house, leaving just the original front elevation (self-build.co.uk/lamb)

VAT RECLAIMS

Can I reclaim VAT on my extension?

When having a structural survey carried out for a large extension, the surveyor discovered that the footings of my original dwelling were unsuitable. As a result, about 95% of the property was knocked down and new footings were constructed. The only parts still standing are a relatively recent extension and two small corner walls. If I demolish those two small walls, will my project be considered a new build and qualify for a VAT reclaim?

As it stands, your paper trail shows your project as an extension which means it's not eligible for the zero-rated VAT scheme (VAT 431NB). Qualifying as a zero-rated project (a self build) would allow you to make a VAT reclaim at the end of the project on items you've directly purchased and tradespeople. You are almost at the point of being eligible as a knock-down and rebuild, which is treated as a new build and qualifies for zero-rated VAT. In this instance, the extension and the two corners would have to come down to qualify.

However, even then, as your paper trail still identifies your project as an extension, you'd require a letter from the local planning authority stating that they are happy to treat this as a new build. You can then knock down the remaining walls. Alternatively, submit a brand new planning application to the local authority for a replacement dwelling. If you manage to get a letter (not an email) from the local planning authority advising they are happy for you to proceed, I still suggest taking photographic evidence of the works.

PROJECT MANAGEMENT

How can I keep my self build schedule on-track?

I'm planning a self build project and looking for some advice on how to keep my construction programme on schedule. What are the key areas to look out for and what should I avoid to ensure completion on time and within budget?

Creating a sturdy build schedule and realistic timeline is the most important part of a successful self build project. This isn't just a series of dates – it's the foundation of the entire build and will be used by everyone to ensure milestones are hit on time, the team stay motivated and all parties are held accountable. A Gantt chart or a detailed spreadsheet is suitable for this.

The first place to start is with a clear, realistic end date (or a target). You can then work backwards and build your schedule around this. Once planning permission, design, sourcing materials etc are factored in, the start date may seem closer than you anticipated, but this should keep you focused.

You'll need to be realistic with lead times for the various build components, such as a timber frames and bespoke windows, as these elements can take a while to manufacture and be delivered to site. You should also ensure a good level of communication and some contingency time in case of weather-related delays.

The biggest and most important things to remember are that a build programme is a live document, and a well-managed project is all about communication. You should be checking in on progress regularly to allow for any deadline adjustment before it's too late.

Steve and Suzanne Richardson took a hands-on approach when building their and eco-friendly timber home. Their top tip? "Plan ahead when it comes to obtaining materials and getting them on site," says Suzanne. (self-build.co.uk/richardson)

MATTHEW SMITH

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There may be a fee for mortgage advice. The actual amount you pay will depend on your circumstances. The fee is up to 1% but a typical fee £395.

Self build & custom build mortgage table

Looking to fund your bespoke home project? Each month we round up the best deals from leading lenders and update you on what you need to know to secure the right finance

Advance Stage Payment Mortgages

Created by and exclusive to BuildStore, these mortgages provide guaranteed stage payments based on your costs before each phase of the build. This offers certainty in your budget and peace of mind that you can plan for and pay your bills on time.

Arrears Stage Payment Mortgages

These mortages release funds after each stage of building works is completed. To trigger the payments, a valuation must take place that shows an uplift in value. BuildStore's exclusive mortgages can offer increased borrowing of up to 85% of your costs.

Get In Touch

For advice on funding options for your self or custom build project, speak to the experts at BuildStore by calling **0345 223 4647** or visit **www.buildstore.co.uk**

These products are chosen for illustrative purposes, and were available at the time of going to press.

KEY FOR TABLE: ★ BuildStore Exclusive Product | SB Self Build Mortgage | CB Custom Build Mortgage | LTV Loan to Value

Lender		Mortgage Type	Payment Schedule	Contact	LTV Land	LTV End Value	Interest Rate	1st Stage Payment
Chorley BS	★	SB & CB	Advance	0345 223 4647	85%	80%	5.99%	DPP & Building Regs
Darlington BS	★	SB & CB	Advance	0345 223 4647	85%	80%	5.89%	DPP & Building Regs
Furness BS	★	SB & CB	Advance	0345 223 4647	80%	80%	5.49%	DPP & Building Regs
Furness BS (Green Build)	★	SB & CB	Advance	0345 223 4647	80%	80%	5.54%	DPP & Building Regs
Hinckley & Rugby BS	★	SB & CB	Advance	0345 223 4647	90%	80%	5.70%	DPP & Building Regs
Mansfield BS	★	SB & CB	Advance	0345 223 4647	85%	80%	5.79%	DPP & Building Regs
Tipton & Coseley	★	SB & CB	Advance	0345 223 4647	85%	75%	5.55%	DPP & Building Regs
Vernon BS	★	SB & CB	Advance	0345 223 4647	85%	80%	6.09%	DPP & Building Regs
Chorley BS	★	SB & CB	Arrears	0345 223 4647	40%	40%	4.99%	Foundations
Darlington BS	★	SB & CB	Arrears	0345 223 4647	85%	80%	5.49%	Foundations
Furness BS	★	SB & CB	Arrears	0345 223 4647	40%	40%	5.25%	Foundations
Furness BS (Green Build)	★	SB & CB	Arrears	0345 223 4647	80%	80%	5.44%	Foundations
Hinckley & Rugby BS	★	SB & CB	Arrears	0345 223 4647	70%	70%	5.55%	Foundations
Mansfield BS	★	SB & CB	Arrears	0345 223 4647	80%	80%	5.60%	Foundations
Stafford Railway BS	★	SB & CB	Arrears	0345 223 4647	85%	80%	5.95%	Foundations
Tipton & Coseley BS	★	SB & CB	Arrears	0345 223 4647	85%	75%	5.20%	Foundations
Vernon BS	★	SB & CB	Arrears	0345 223 4647	85%	80%	5.90%	Foundations
Beverley BS		SB	Arrears	01482 881510	50%	80%	5.64%	Wall Plate
Earl Shilton BS		SB	Arrears	01455 844422	75%	75%	6.14%	Flexible
Hanley Economic BS		SB & CB	Arrears	01782 255000	80%	80%	5.84%	Foundations
Melton Mowbray BS		SB	Arrears	01664 414141	n/a	75%	6.00%	Foundations
Penrith BS		SB	Arrears	01768 863675	80%	80%	5.89%	Foundations
Saffron BS		SB & CB	Arrears	0333 015 2970	80%	80%	6.19%	Flexible
Suffolk BS		SB	Arrears	0330 123 0723	70%	70%	5.90%	Foundations

FIND YOUR DREAM BUILDING PLOT

PlotBrowser.com is Build It's free-to-use plot and property finder, giving you access to 1,000s of verified home building opportunities across the UK. Updated daily, our platform is your dedicated resource for genuine self build land and renovation opportunities.

Every listing is either vetted as having planning in place or assessed by one of our dedicated team as having genuine planning potential – so you don't need to waste your time looking at duds that may never gain consent to build. Whether you're ready to buy, researching the local market or have a site to sell, **PlotBrowser.com** is your essential building plot resource.

PlotBrowser from BuildIt magazine

START YOUR PLOT SEARCH

To find more plots with planning permission across the UK, and get free notifications of new opportunities based on your personal criteria, sign up today at **www.PlotBrowser.com**

GOT A PLOT TO SELL?
Head to **PlotBrowser.com** and register as a seller to list your plot for free.

ENGLAND

BEDFORDSHIRE

HITCHIN
Castles Close
A plot currently forming part of a garden, with planning consent for a two-bedroom detached bungalow.
Guide price: £150,000
Planning: Central Bedfordshire Council CB/22/03992/FULL
Contact: Wellington Evans 01462 229555 hello@wellingtonevans.co.uk
Plot ID: 138369

BERKSHIRE

SUNNINGDALE
Sunning Avenue
A 0.7-acre plot. Planning consent has been applied for a replacement detached dwelling following the demolition and clearance of the existing fire-damaged dwelling.
Guide price: £2,000,000
Planning: Royal Borough of Windsor and Maidenhead 24/02573
Contact: Savills 01344 626162 sunningdale@savills.com
Plot ID: 138281

TAPLOW, MAIDENHEAD
Boundary Road
Planning permission has been granted for a 188m^2 four-bedroom home, set in around 0.25 acres.
Guide price: £600,000
Planning: South Buckinghamshire District Council PL/24/1603/FA
Contact: Knight Frank LLP 01494 675368 beaconsfield@knightfrank.com
Plot ID: 138245

BUCKINGHAMSHIRE

GREAT MISSENDEN
Rignall Road
Plot of six acres with planning permission granted to build a contemporary detached home of around 479m^2 set over three floors, following the demolition of the existing dwelling, stables and two other outbuildings. The new home will have a terrace and pool to the rear and parking area to the front.
Guide price: £1,470,000
Planning: Chiltern District Council PL/22/0927/FA
Contact: Bartrams 01494 870707 homes@bartrams.co.uk
Plot ID: 138244

CAMBRIDGESHIRE

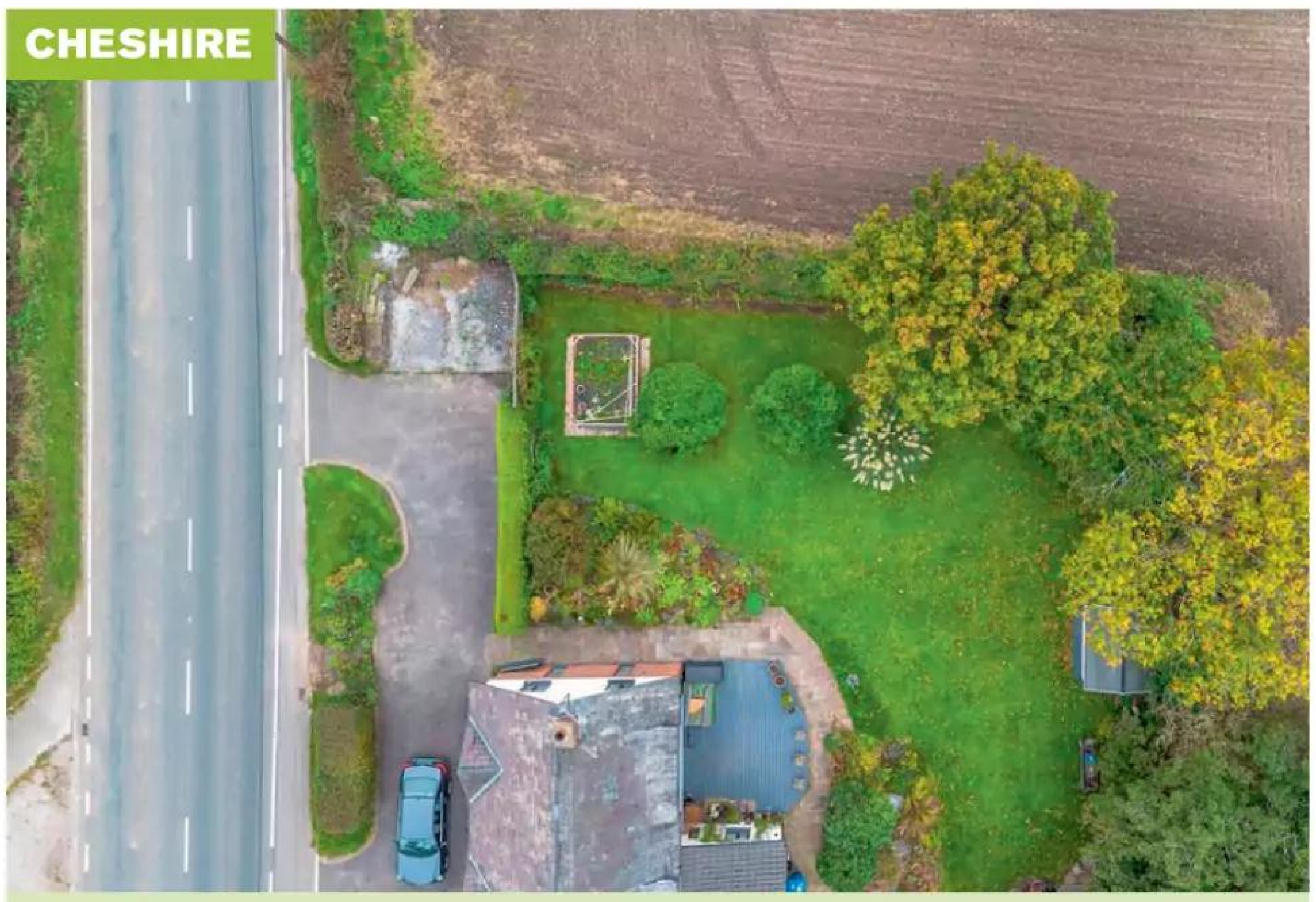
CAMBRIDGE
Land for sale
A 0.12-acre site with full planning permission for a single-storey, four-bedroom detached home of approx 132m^2 with off-street parking.
Guide price: £225,000
Planning: Cambridge City Council 22/00440/FUL
Contact: Haart 01908 753096 milton.keynes@haart.co.uk
Plot ID: 138259

HIGHFIELD, HUNTINGDON
Land for sale
Full planning permission has been granted for a four-bedroom detached home on a site of one third of an acre.
Guide price: £260,000
Planning: Huntingdonshire District Council 17/01800/FUL
Contact: Optimum Lettings & Property Management 01733 459132 info@optimumlettings.co.uk
Plot ID: 138368

CORNWALL

FOXHOLE
Plot for sale

CHESHIRE



STRETTON
Stretton Road
Building plot with outline planning permission granted for a single detached home with a private driveway and landscaped gardens.
Guide price: £250,000
Planning: Warrington Borough Council 2025/00380/OUT
Contact: Ashtons 01942 364446 ashton@ashtons.net
Plot ID: 138356

TYPES OF BUILDING PLOT

New homes can be built on a range of sites and knowing about the opportunities can help you spot land with potential. Here are the key options:

BROWNFIELD SITES

This refers to previously developed land that is or was once occupied by a permanent structure. Government policy supports the provision of new housing in such locations and, on a practical level, services are likely to be in place.

DEMOLISH & REPLACE

A type of brownfield opportunity where you could knock down a building, such as an old bungalow, and construct a new home in its place. It's often more cost-effective than a renovation as VAT can be reclaimed on a new build project.

EDGE-OF-SETTLEMENT

Depending on the maps in the relevant council's Local Plan, this kind of site may or may not fall within existing built-up area boundaries. Generally, policies allow development within this zone, but control it very strictly outside. Any undeveloped land, known as greenfield, will typically only support housing to serve the needs of agriculture, replacement dwellings and some infill.

INFILL PLOTS

Many councils define this as a small gap between an otherwise built-up frontage or group of houses. Infilling is usually allowed within settlements' development boundaries, and sometimes outside of these. Gaining consent will be more difficult in zones such as conservation areas.

GARDENS

Contrary to the 'backland development' headlines of a few years ago, planners still allow schemes on garden plots, especially in places that are considered to be built-up. You may even be lucky enough to have a large space that could work as a viable site or know someone who is willing to negotiate a fair price.

SERVICED PLOTS

Land that's ready to build on, with utilities, highway access and potentially other infrastructure already in place, as well as at least outline planning consent. This route offers more certainty over early-stage costs.

Plot with planning permission granted for a three- to four-bedroom house with garage, garden and driveway.
Guide price: £95,000
Planning: Cornwall Council PA22/07605
Contact: Cornish Bricks 01872 211655 contactus@cornishbricks.co.uk
Plot ID: 138265

STRATTON, BUDE
Hillhead
A plot with conditional planning consent in place for a three-bedroom detached property, which comes with ample off-road parking and gardens.
Guide price: £125,000
Planning: Cornwall Council PA24/02642
Contact: Webbers 01288 353661 bude@webbers.co.uk
Plot ID: 138377

COUNTY DURHAM

GRANVILLE AVENUE
Land for sale
A site of 252m^2 with full planning permission granted for a pair of three-bedroom semi-detached homes.
Guide price: £50,000
Planning: Durham County Council DM/23/03715/FPA
Contact: David Bailes Property Professionals 01207 231111 info@davidbailes.co.uk
Plot ID: 138226

DERBYSHIRE

CLOWNE
Ringer Lane
A plot with lapsed outline planning permission for three detached homes.
Guide price: £500,000
Planning: Bolsover District Council 12/00307/OUT
Contact: Private seller alistairjatkinson@gmail.com
Plot ID: 138391

DEVON

WARCOMBE
Swallowfields
A plot on North Devon's scenic coast with stunning uninterrupted sea and countryside views. This plot has full planning permission in place for a substantial contemporary property designed by Kost Architects Limited.
Guide price: £650,000
Planning: North Devon Council 78989
Contact: Private seller 07860 214303 leemanorfarm@sky.com
Plot ID: 138210

EAST SUSSEX

ST. LEONARDS-ON-SEA
Shirley Drive
Land with planning consent in place for a detached, 185m^2 four-bedroom house with a driveway providing off-road parking for up to two vehicles.
Guide price: £200,000
Planning: Hastings Borough Council HS/FA/25/00334
Contact: PCM Estate Agents 01424 839111 info@pcmestateagents.co.uk
Plot ID:138318

ESSEX

GREAT LEIGHS
School Lane
Detailed planning consent is in place for the demolition of the existing stables and the erection of a four-bedroom detached bungalow, set in a plot measuring around 1.1 acres
Guide price: £450,000
Planning: Chelmsford City Council 25/00978/FUL
Contact: Beresfords - Land and New Homes 01245 447938 land@beresfords.co.uk
Plot ID: 138212

GLOUCESTERSHIRE

LYDNEY
Springfield Road
A 0.24-acre plot with full planning permission for a detached, five-bedroom modern property with parking and good-sized garden.
Guide price: £200,000
Planning: Forest of Dean District Council P1474/24/FUL
Contact: David James 01600 712916 monmouth@djpnr.co.uk
Plot ID: 138266

GREATER LONDON

WORCESTER PARK
Cuddlington Avenue
A 175m^2 plot of land with full planning permission granted for a two- to three-bedroom property with potential for parking and outdoor space.
Guide price: £230,000
Planning: Epsom and Ewell Borough Council 25/00292/FUL
Contact: Century 21 Royale 0115 9021 002 info@century21uk.com
Plot ID: 138363

HAMPSHIRE

HEADLEY
Ashford Hill Road
Single building plot measuring over 0.7 acres with outline planning consent in place for the construction of a spacious five-bedroom detached property of over 316m^2.
Guide price: £425,000
Planning: Basingstoke and Deane Borough Council 25/00255/OUT
Contact: Private seller 07791 661491 guy@blueinfinityproperty.com
Plot ID: 138242

MONKWOOD, ALRESFORD
Petersfield Road
Site with full planning permission for a four-bedroom bungalow with a linked garage and annexe accommodation, extending to approx 232m^2. The plot features 11.2 acres of paddocks and agricultural land.
Guide price: £1,250,000
Planning: East Hampshire District Council EHDC-24-0067-FUL
Contact: Fine & Country Leamington Spa 01926 455950 leamington@fineandcountry.com
Plot ID: 138293

HERTFORDSHIRE

CUFFLEY
East Ridgeway
Plot with planning permission in place

EAST SUSSEX

HAILSHAM
Windmill Hill
A plot of around one third of an acre with planning permission for the erection of a double fronted detached property with detached garage and rural views.
Guide price: £350,000
Planning: Wealden District Council WD/2024/2931F
Contact: Campbell's Estate Agents 01424 774774 info@campbellsproperty.co.uk
Plot ID: 138358

for a split-level, four-bedroom detached home with the principal accommodation set at the lower level facing onto the garden/decking area.
Guide price: £850,000
Planning: Welwyn Hatfield Council 6/2016/1949/FULL
Contact: Statons 020 8449 3383 barnet@statons.com
Plot ID: 138258

ISLE OF MAN

BALLAKILPHERIC, COLBY
Land for sale
A large plot of approx 465m² with full planning permission for a three-bedroom detached house, with an extra strip of land also available.
Guide price: £185,000
Planning: Isle of Man Government 22/01320/B
Contact: Private seller 07624 464850 julieblackburn53@gmail.com
Plot ID: 138254

KENT

IGHTHAM, SEVENOAKS
Oldbury Lane
A substantial building plot with planning consent for a contemporary house in a highly regarded village.
Guide price: £725,000
Planning: Tonbridge and Malling Borough Council 23/03379
Contact: Strutt & Parker 01732 459900 sevenoaks@struttandparker.com
Plot ID: 138294

LANCASHIRE

BOLD HEATH
Mill Lane
Extending to approx 0.4 acres, a plot with planning consent in principle for two substantial detached homes.
Guide price: £495,000
Planning: St Helens Metropolitan Borough Council P/2025/0081/PIP
Contact: Ashtons 01942 364446 ashton@ashtons.net
Plot ID: 138262

LINCOLNSHIRE

LINCOLN
Carline Road
A building plot measuring around 0.11 acres with full planning permission for a four-storey detached home.
Guide price: £180,000
Planning: City of Lincoln Council 2022/0966/FUL
Contact: Pygott & Crone 01522 568822 lincoln@pygott-crone.com
Plot ID: 138231

NORFOLK

FREETHORPE, NORWICH
The Green
A 0.27-acre plot with planning permission granted for a four-bedroom house with parking, an integral double garage and gardens.
Guide price: £160,000
Planning: Broadland District Council Refer to agent
Contact: Starkings & Watson 01603 336556 headoffice@starkingsandwatson.co.uk
Plot ID: 138365

NORTH YORKSHIRE

KEIGHLEY
Cowling
This plot includes foundations and natural stone construction up to first-floor level, with full planning permission for a large property.
Guide price: £200,000
Planning: Craven District Council ZA25/27216/FUL
Contact: Wilman & WIlman 01535 637333 office@wilman-wilman.co.uk
Plot ID: 138213

LINCOLNSHIRE

DONINGTON
Northorpe Road
Single plot with planning consent in place for the demolition of the existing workshop and yard and the construction of a four-bedroom detached house with double garage.
Guide price: £220,000
Planning: South Holland District Council H04-0486-24
Contact: Ark Property Centre 01775 766888 info@arkpropertycentre.co.uk
Plot ID: 138323

NOTTINGHAMSHIRE

SUTTON-IN-ASHFIELD
Croxmoor Road, Plot 1
A building plot of 0.44 acres with detailed planning consent for a detached, four-bedroom home measuring 375m² with a separate detached double garage.
Guide price: £500,000
Planning: Ashfield District Council V/2025/0370
Contact: Richard Watkinson & Partners 01623 626990 mansfield@richardwatkinson.co.uk
Plot ID: 138334

NORTHAMPTONSHIRE

EYDON DAVENTRY
Moreton Road
Plot with full planning permission for a detached four-bedroom self build or custom build dwelling. Integrated garage with off-road parking.
Guide price: £290,000
Planning: West Northamptonshire Council 2024/1656/FULL
Contact: Fine & Country 01788 820062 rugby@fineandcountry.com
Plot ID: 138332

NORTHUMBERLAND

GLANTON
Whittingham Road
A 334m² fully serviced plot with full planning permission for a three-bedroom detached house of around 153m² with parking and gardens.
Guide price: £175,000
Planning: Northumberland County Council 23/00485/FUL
Contact: Northumberland Properties 01665 660910 info@northumberlandproperties.co.uk
Plot ID: 138366

OXFORDSHIRE

HENLEY-ON-THAMES
Colmore Lane
A 0.74-acre plot with planning permission granted for a family home. The proposed house is just over 465m² and has a driveway, detached double garage and large garden.
Guide price: £1,500,000
Planning: South Oxfordshire District Council P24/S1830
Contact: Davis Tate 01491 412345 henley@davistate.com
Plot ID: 138274

SOMERSET

SOMERTON
Bancombe Road
A spacious building plot with full planning permission granted for a four-bedroom dwelling. Outside, there is a garden, garage and driveway.
Guide price: £170,000
Planning: Somerset Council -South Somerset area 25/01240/FUL
Contact: Holland & Odam 01458 785100 somerton@hollandandodam.co.uk
Plot ID: 138337

SOUTH YORKSHIRE

MOSBOROUGH, SHEFFIELD
Plot 2 Plumbley Hall Farm
One of three plots, available separately, with planning permission granted for the existing barns to be converted into two, four-bedroom homes and a three-bedroom house. Plot two has consent for a three-bedroom property of 144m².
Guide price: £275,000
Planning: Sheffield City Council 24/00027/FUL
Contact: Blenheim Park Estates 0114 358 2020 enquiries@bpestates.co.uk
Plot ID: 138359

SUFFOLK

NEAR IPSWICH
Bucklesham
Plot with planning permission in place to refurbish/convert this former watermill which has most recently been used as offices. The proposed three-bedroom dwelling will benefit from off-road parking and a garden.
Guide price: £195,000
Planning: East Suffolk Council DC/24/3525/FUL
Contact: Clarke & Simpson 01728 724200 jcook@clarkeandsimpson.co.uk
Plot ID: 138384

SURREY

CAMBERLEY
Tremayne Walk
Plot with planning permission granted

for a three-bedroom detached home.
Guide price: £675,000
Planning: Surrey Heath Borough Council 22/0091/FFU
Contact: Vickery & Co 01483 797974 westend@vickery.co.uk
Plot ID: 138338

WARWICKSHIRE

SOUTHAM
Land for sale
Planning permission has been granted for the demolition of the existing steel barn, modern garages, and dilapidated outbuildings, making way for a barn-style residence of around 247m^2 and the conversion of a traditional stone building into a garage, all set on a 1.3-acre plot.
Guide price: £400,000
Planning: Stratford-on-Avon District Council APP/J3720/W/24/3351111
Contact: Sheldon Bosley Knight 01789 292310 stratford@sheldonbosleyknight.co.uk
Plot ID: 138339

WILTSHIRE

CALNE
Quemerford
A building plot with detailed planning permission in place for a 145m^2, three-bedroom detached home with a double carport and gardens.
Guide price: £185,000
Planning: Wiltshire Council PL/2024/07571
Contact: Butfield Breach 01225 311151 bath@butfieldbreach.co.uk
Plot ID: 138339

SOMERSET

MELLS
Top Lane
Land with full planning permission in place for the construction of a three- to four-bedroom detached house with parking for three cars and a private, enclosed garden.
Guide price: £295,000
Planning: Mendip District Council 2024/0620/FUL
Contact: Cooper and Tanner 01373 455060 frome@cooperandtanner.co.uk
Plot ID: 138252

SCOTLAND

ABERDEENSHIRE

ELLON
Monteach Road
A 0.6-acre plot with planning consent granted for a 1.5-storey property.
Guide price: £75,000
Planning: Aberdeenshire Council APP/2020/0566
Contact: Selling Granite 07736 546518 judith@sellinggranite.uk
Plot ID: 138223

HUNTLY
Lumsden
A plot of approx one acre with full planning permission granted for a three-bedroom detached home and a fully constructed two-storey garage.
Guide price: £130,000
Planning: Aberdeenshire Council APP/2016/1599
Contact: Re/Max Aberdeen City & Shire 07810 010053 gmoyse@remax-aberdeen.net
Plot ID: 138376

LESLIE
Land for sale
Plot with planning permission granted for the conversion of a commercial property into a two-bedroom dwelling.
Guide price: £85,000
Planning: Aberdeenshire Council APP/2022/1619
Contact: Prime Property Auctions 0141 459 0201 info@primepropertyauctions.co.uk
Plot ID: 138218

ANGUS

MONTROSE
Land for sale
A building plot with full planning consent and a building warrant in place, this site is primed for the erection of a four-bedroom home.
Guide price: £98,500
Planning: Aberdeenshire Council APP/2021/2199

PROMOTED PLOT

SELF BUILD OPPORTUNITY IN THE LAKE DISTRICT

DEVELOPMENT **Wellbank**
LOCATION **Bootle, Cumbria**
AVAILABLE PLOTS **12 in Phase Two**
PLOT SIZE **400m^2-1,000m^2**
PLANNING **Lake District National Park Authority 7/2023/4052**
CONTACT **07511 087197 www.wellbankpark.co.uk**

Surrounded by green spaces, Wellbank is a rare opportunity to self or custom build your dream home in one of the UK's most desirable locations – the Lake District National Park.

Buyers can choose how much involvement they want in the design – from full self build flexibility to selecting from a range of pre-approved homes, all within a carefully crafted Design Code.

Why build at Wellbank?
At Wellbank, every detail is designed for quality, comfort and wellbeing. Creating your new tailor-made home at Wellbank offers you:

- Fully-serviced, ready-to-build plots with planning permission already in place.
- Option to design your own home or choose a turnkey solution.
- Expert guidance throughout the design, planning and build.
- Sustainable, efficient homes with renewable energy options.
- Ultra-fast fibre connectivity for modern living.
- Biodiverse, wellbeing-led landscaping.
- Wellbank's on-site Waterside will provide a swimming pool, spa, wellness centre, cafe, bar and bistro – bringing people together in a beautiful, sustainable setting.

BARN FOR CONVERSION IN A STUNNING RURAL SETTING

1

2

LOCATION Cradley, Malvern, Worcestershire

GUIDE PRICE £475,000

PLANNING Malvern Hills District Council M/25/00268/GPDQ

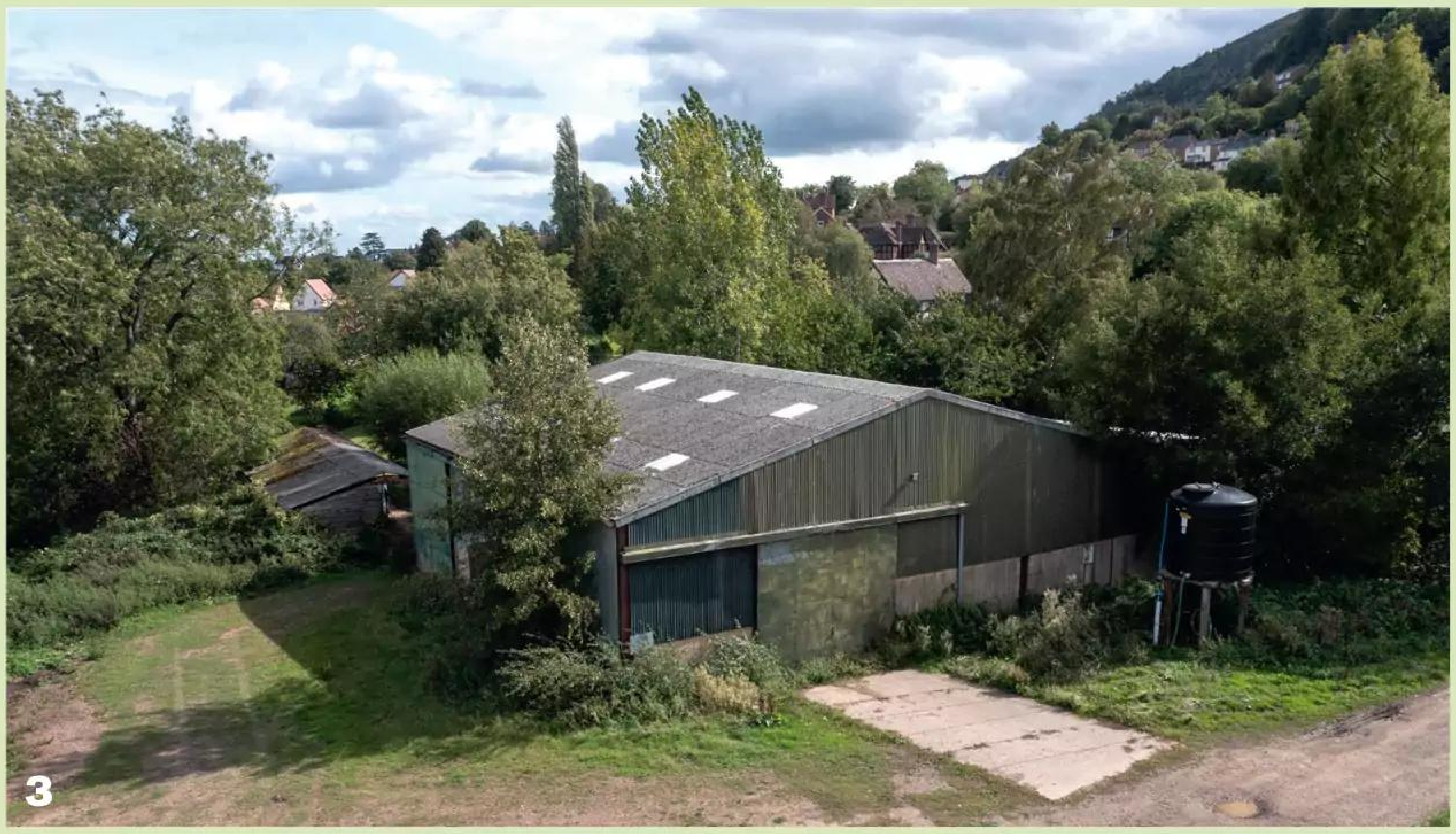
CONTACT Fisher German 01905 726220 enquiries@fishergerman.co.uk

Plot ID: 138340

Set in 4.78 acres of land on the slopes of the Malvern Hills, Cowleigh Park Barn provides an opportunity for the purchaser to create a bespoke home in a picturesque rural spot.

Lot 1 comprises an agricultural building extending to around 306m² benefiting from far-reaching views. The barn is of steel portal framed construction, with a fibre cement roof, corrugated iron clad sides with low level block walling and concrete floor. Class Q consent has been granted for its conversion into a substantial residential dwelling, complete with stables and paddocks. The proposed home will have three bedrooms, three reception rooms, two bathrooms and a large garage. The stables will extend to around 72.5m², made up of four separate blocks.

Set partly within the Malvern Hills National Landscape (formerly AONB) and incorporating Mill Coppice, a designated ancient woodland, the property enjoys a natural setting with great appeal for outdoor enthusiasts. The Victorian spa town of Malvern is recognised as a cultural hub, with theatres, independent shops and supermarkets, a cinema, cafes, excellent schools, pubs and restaurants. The area is well connected by train and car, with Birmingham International Airport situated just an hour's drive away.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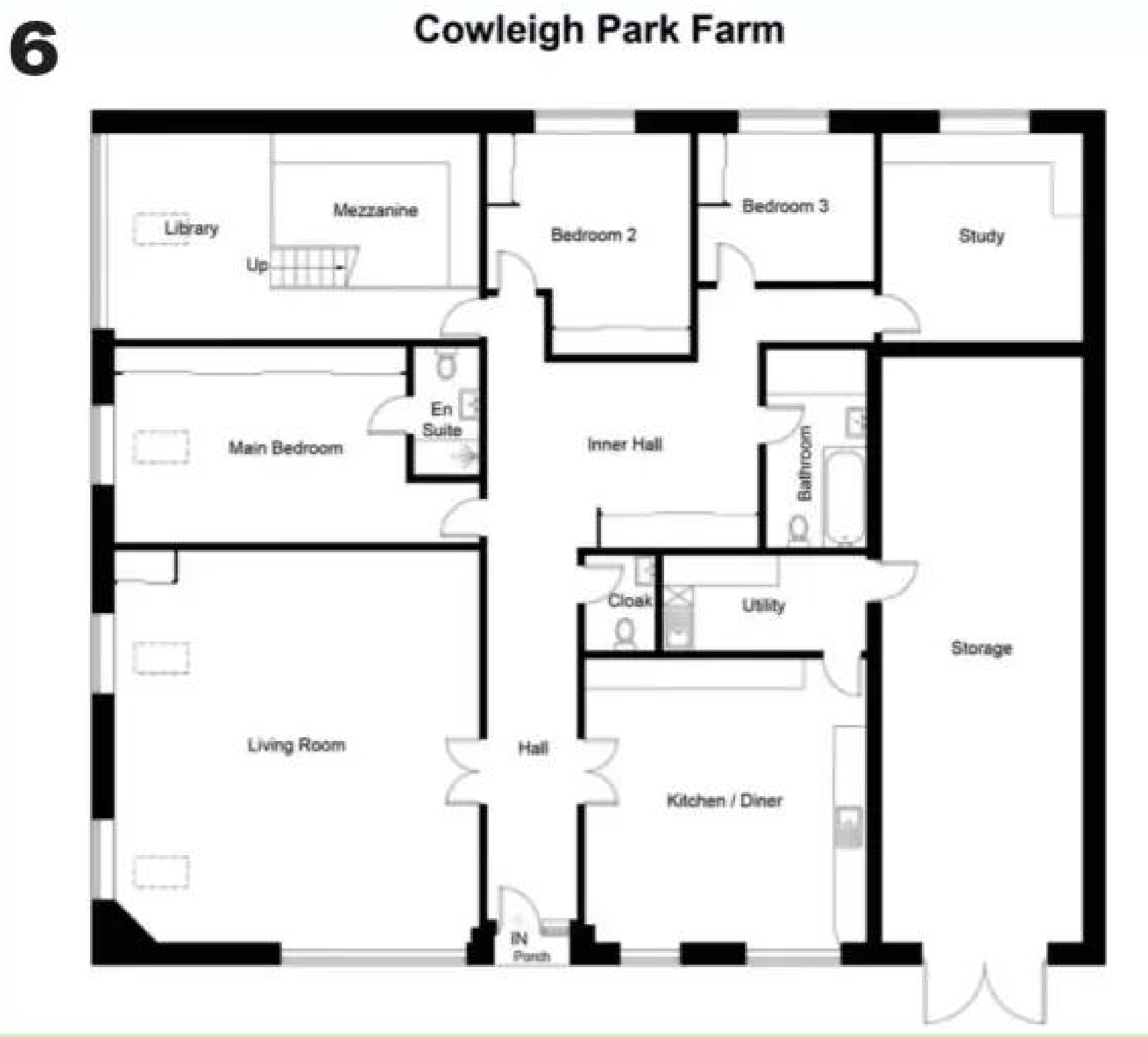

1 Cowleigh Park Farm enjoys stunning views as far as the eye can see

2 The slopes of the Malvern Hills provide a peaceful location

3 The barn has class Q consent for residential conversion

4 The long driveway provides a great degree of privacy

5 The site is picturesque in nature

6 The proposed three-bedroom home will also have three reception rooms

Contact: Mcintyre Properties - Dundee 01382 780050 info@mcintyre-properties.com
Plot ID: 138352

ARGYLL AND BUTE

DUNOON

Victoria Parade
A 0.25 acre waterfront site with full planning consent for a three-storey home. Cleared and ready to develop.
Guide price: £150,000
Planning: Argyll and Bute Council 21/02538/PP
Contact: Dunoon Property 01369 760321 mail@dunoonproperty.com
Plot ID: 138260

DUMFRIES & GALLOWAY

LOCHFOOT

Hawthorne Cottage
An opportunity to purchase a plot and workshop together or separately. The plot has permission in principle for a home. The workshop comes with a garden which has consent for change of use to residential.
Guide price: £65,000
Planning: Dumfries and Galloway Council 24/1699/PIP
Contact: JHS Law 01387 739000 info@jhslaw.co.uk
Plot ID: 138240

EAST AYRSHIRE

KILMARNOCK

Spittal Hill
A 2.4-acre building plot with planning consent for residential development.
Guide price: £115,000
Planning: South Ayrshire Council 24/00843/APP
Contact: Prime Property Auctions 0141 459 0201 info@primepropertyauctions.co.uk
Plot ID: 138355

MUIRKIRK

Wellwood Street
A 1.5-storey, four-bedroom detached bungalow with a plot of land that has consent for residential development.
Guide price: £25,000
Planning: East Ayrshire Council 24/0390/PP
Contact: Prime Property Auctions 0141 459 0201 info@primepropertyauctions.co.uk
Plot ID: 138316

FIFE

LEUCHARS, ST. ANDREWS

Plot 2 Fordelhills
A large cleared plot of 1,140m², with planning permission in principle for a detached home with services, associated access and parking.
Guide price: £200,000
Planning: Fife Council 20/02172/PPP
Contact: Rettie & Co 01334 237700 standrews@rettie.co.uk
Plot ID: 138320

HIGHLAND

TIGH RAIBEART AIR LINNE

Ardgay
A single plot with planning permission granted in principle for the erection of a five-bedroom detached property.
Guide price: £84,000
Planning: Highland Council 22/02565/PIP
Contact: Braveheart Auctions 0131 278 3565 sales@braveheartauctions.co.uk
Plot ID: 138322

MORAY

TOMINTOUL

Main Street
A plot extending to approx 0.15 acres with consent previously granted for the erection of a four-bedroom, one-and-a-half-storey property.
Guide price: £30,000
Planning: Cairngorm National Park 17/01586/APP
Contact: Masson Cairns 01479 874800 property@lawscot.com
Plot ID: 138325

WALES

CARMARTHENSHIRE

BETWS, AMMANFORD

Woodlands Park
A level plot with consent granted for a three-bedroom bungalow.
Guide price: £90,000
Planning: Carmarthenshire County Council PL/07432
Contact: Anna Ashton Estate Agents 01269 839392 ammanford@annaashton.wales
Plot ID: 138361

LLANWRDA

Harford
A Grade II listed stone and slate farmhouse requiring renovation, with planning consent and listed building consent for full renovation. The land extends to approx 58 acres in total.
Guide price: £465,000
Planning: Carmarthenshire County Council PL/05798
Contact: Morgan & Davies 01570 423623 lampeter@morgananddavies.co.uk
Plot ID: 138092

CEREDIGION

ABERYSTWYTH

Llanafan
A single plot with outline planning permission granted for a detached property with ample off-road parking and countryside views. Services are nearby, including private drainage.
Guide price: £50,000
Planning: Ceredigion County Council A230832
Contact: Morgan & Davies 01545 571600 aberaeron@morgananddavies.co.uk
Plot ID: 138445

SCOTTISH BORDERS

GALASHIELS

Dean Street
A 0.19-acre broadly triangular parcel of land. Planning consent has been granted for two detached properties.
Guide price: £80,000
Planning: Scottish Borders Council 24/01363/PPP
Contact: Edwin Thompson 01896 751300 galashiels@edwin-thompson.co.uk
Plot ID: 138336

CONWY COUNTY BOROUGH

COLWYN BAY

Land for sale near the zoo
A 0.75-acre site large enough for six to nine small houses near the zoo.
Guide price: £194,500
Planning: Conwy County Borough Council Exempt
Contact: Private seller 07858 046425 celebrity.gossip.team@gmail.com
Plot ID: 138127

PEMBROKESHIRE

CLYNDERWEN

Maenclochog
A building plot set within approx 10 acres of land with detailed consent for the conversion of the former stone cottage into a two-bedroom cottage.
Guide price: £175,000
Planning: Pembrokeshire County Council 22/0447/PA
Contact: West Wales Properties 01834 845584 tenby@westwalesproperties.co.uk
Plot ID: 138035

HAVERFORDWEST

Land for sale
A former public house with lapsed consent for its conversion into a single four-bedroom property.
Guide price: £199,950
Planning: Pembrokeshire County Council 19/0672/PA
Contact: Bryce & Co 01437 620220 sales@bryceandco.co.uk
Plot ID: 138135

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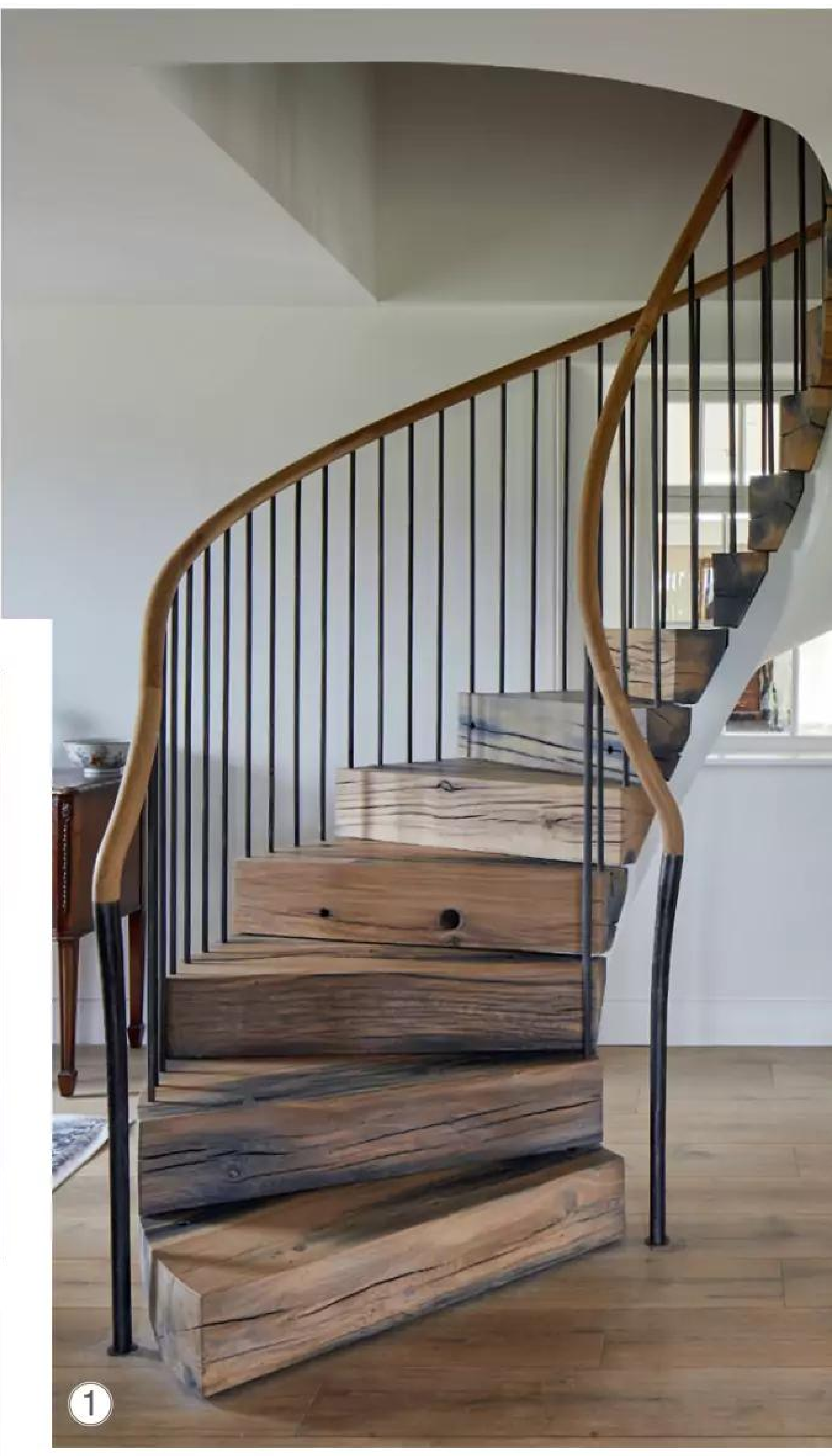
In Focus

Staircases

Looking to add more flair to your flight? This month, check out our selection of specialist stair designers and suppliers who can offer the experience and technical know-how to elevate your home's interior architecture

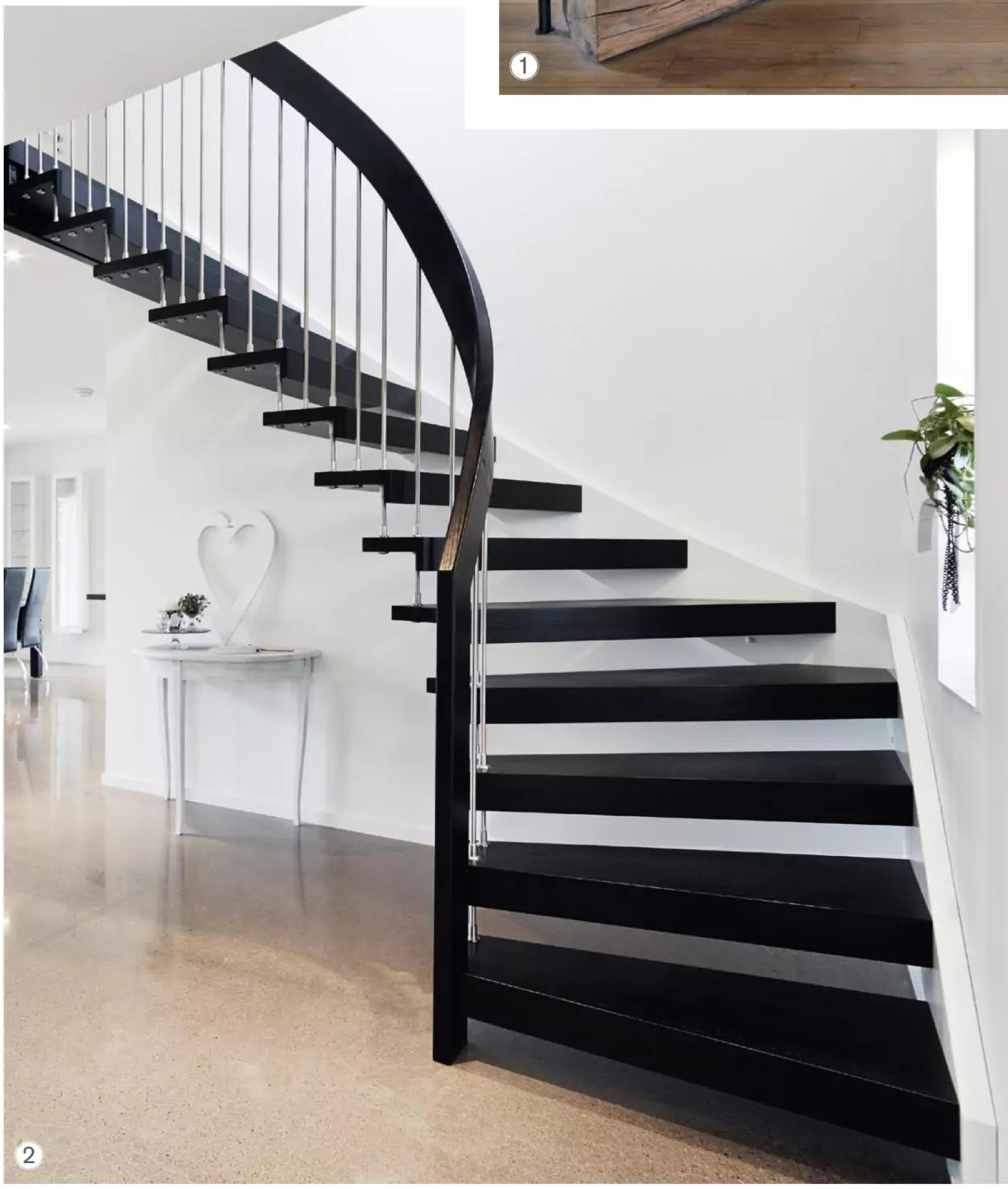


The right staircase can become a powerful architectural feature in your new or renovated home. A quality flight will define your home's entrance space and set the tone for the rest of the interior scheme. The sky's the limit in terms of what can be achieved – whether you're going bespoke or looking for ways to upgrade an existing stair.

Innovative design and quality materials are, of course, two key ingredients for a fabulous staircase. But just as important are the technical details. A good supplier will want to come on board early in the project, working alongside your design team to ensure your new flight not only looks fantastic, but also makes best use of the available space and meets Building Regs efficiently.

Specialist staircase companies are well-placed to offer suggestions that can elevate your flight. For instance, they can advise on whether the design might require extra support in the walls or floors; whether turning the stair could improve use of space across both storeys (and, if so, at what point in the flight that turn would be best located); or even identify more cost-effective ways to achieve the kind of feature staircase you're after. Thinking of continuing up into the loft at a later date? They can also offer guidance on how to streamline the phase-one design and install in order to more easily accommodate the future flight.

While you might find yourself replacing a kitchen or bathroom after five or 10 years, a quality staircase is a lifetime investment. It will add lasting wow factor and value to the finished house, improve the floor plan and transform what can sometimes be a functional feature into an integral part of your lifestyle. Bespoke design is a fantastic option; while a kit flight – perhaps with a few upgrades, such as a luxury handrail or stair runner – could be a canny route to maximising a smaller budget.



1 Designed for a Northumberland barn conversion, this helical flight by Bisca (www.bisca.co.uk) pairs modern design with timeless, tactile materials. The treads are reclaimed from old canal lock gates, tied into the structure with bronze butterflies (inset), while the black forged balusters and timber handrail ooze elegance. **2** This cantilevered flight by Complete Stair Systems (www.completestairsystems.co.uk) achieves a near-floating effect. It was made in solid hardwood and constructed with a one-wall stringer to avoid the need for a structural wall

Bisca Staircases - designing and crafting beautiful staircases for a sustainable future

At Bisca, anything is possible.

We design and craft beautiful staircases - pushing the boundaries for every client by exploring the full potential of your space. Unrestricted by the range of materials we use, your staircase will bear testimony to the passion and meticulous care involved in its creation.

When you commission a staircase from Bisca, you will be taken on your journey, beginning with a consultation with the design team where they will listen to your ideas before interpreting them into a unique design. Our specialist design engineers work in partnership with the manufacturing team to achieve a truly bespoke, hand-crafted finish for every commission they work on.

One of the fundamentals of Bisca is the relationship between the workshop and the design studio. Respecting one another's discipline allows each artisan to work to their full potential and achieve the highest quality of finish - their experience is an important element when it comes to executing the designs. All Bisca's craftspeople are multi-skilled; competent in metalwork, cabinetmaking, blacksmithing, welding, and leather stitching, marrying century-old skills with modern technology in the creation of a commission.

Working with clients worldwide, our team will take care of the entire process, from design concepts to installation and after-care.

Our business is driven by an ethos centred around environmental sustainability, placing a strong focus on sourcing materials responsibly, upcycling and creating strong partnerships with suppliers who share our values.

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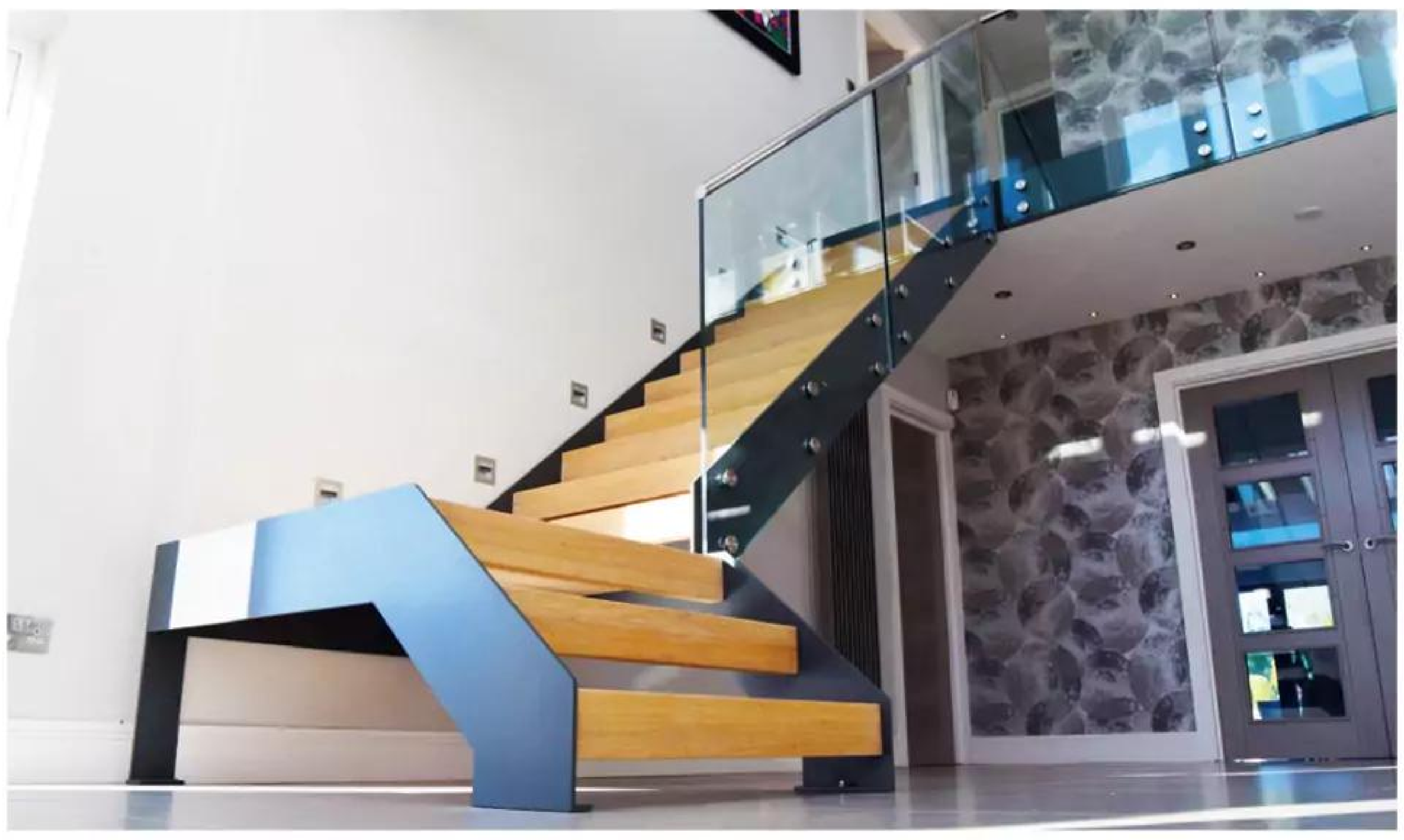

Stylish modern staircases for your build

When it comes to design, a staircase is often overlooked in the UK as it's considered part of the structure of the building. A stair is often constructed in cheap material like softwood and MDF because it is generally enclosed & carpeted. We consider a staircase to be a chance to create a feature in a property and we have been supplying our range of custom and kit stair designs for almost 20 years.

We focus on light, open, and modern structures designed to encourage the passage of light. Our flights are intended to be a focal point within a hallway, reflecting the character of the property.

Our website offers an inspirational collection of pictures of past projects and we have a showroom in Romsey with many of our designs featured.

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At British Spirals & Castings, we believe a staircase should be more than just structural; it should be the centrepiece of your home. Since 1992, our family-run business has been designing and manufacturing bespoke spiral staircases, straight stairs, and balustrades that combine traditional craftsmanship with modern innovation. Working in our non-ferrous foundry, based in Derbyshire, we use only the finest materials to blend heritage techniques like sand-casting with advanced tools such as LiDAR and CAD. The result is a stunning, made-to-measure staircase with timeless beauty and of the highest quality. Our staircases are easy to install, often by homeowners themselves, and we deliver worldwide with a simple, reliable process. Each piece is individually tailored to you, your home and your lifestyle. If you can imagine it, we can create it.

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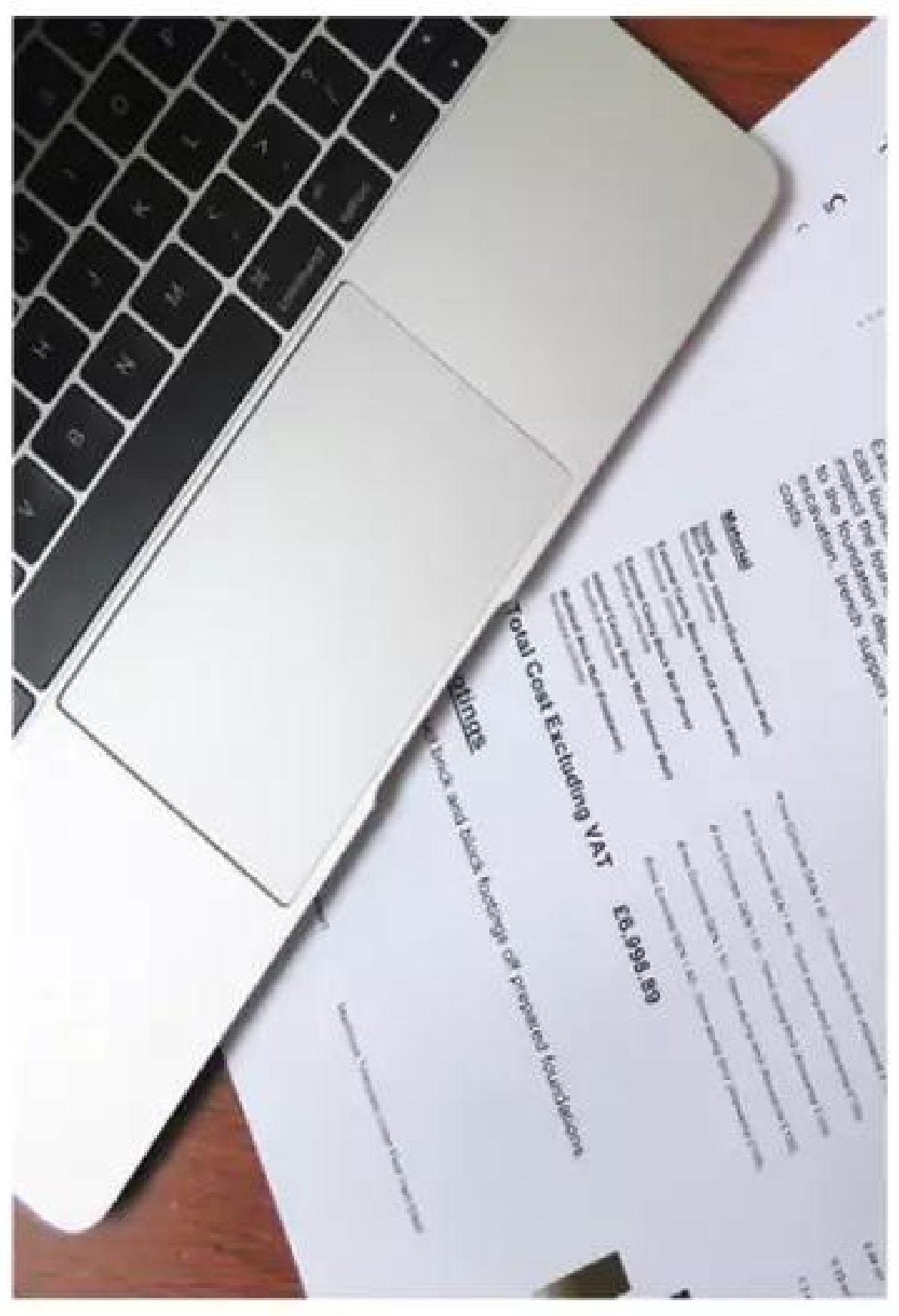

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If you're thinking about extending your home, knowing a realistic cost before you meet with builders can be vital. Not only will it help you to negotiate the cost of the job but it will also help you better understand your options of finishes and fittings and how this will impact the overall price. This tailored costing service includes a schedule planner and cashflow forecast for your extension – essential if you're looking to get a loan for your project.

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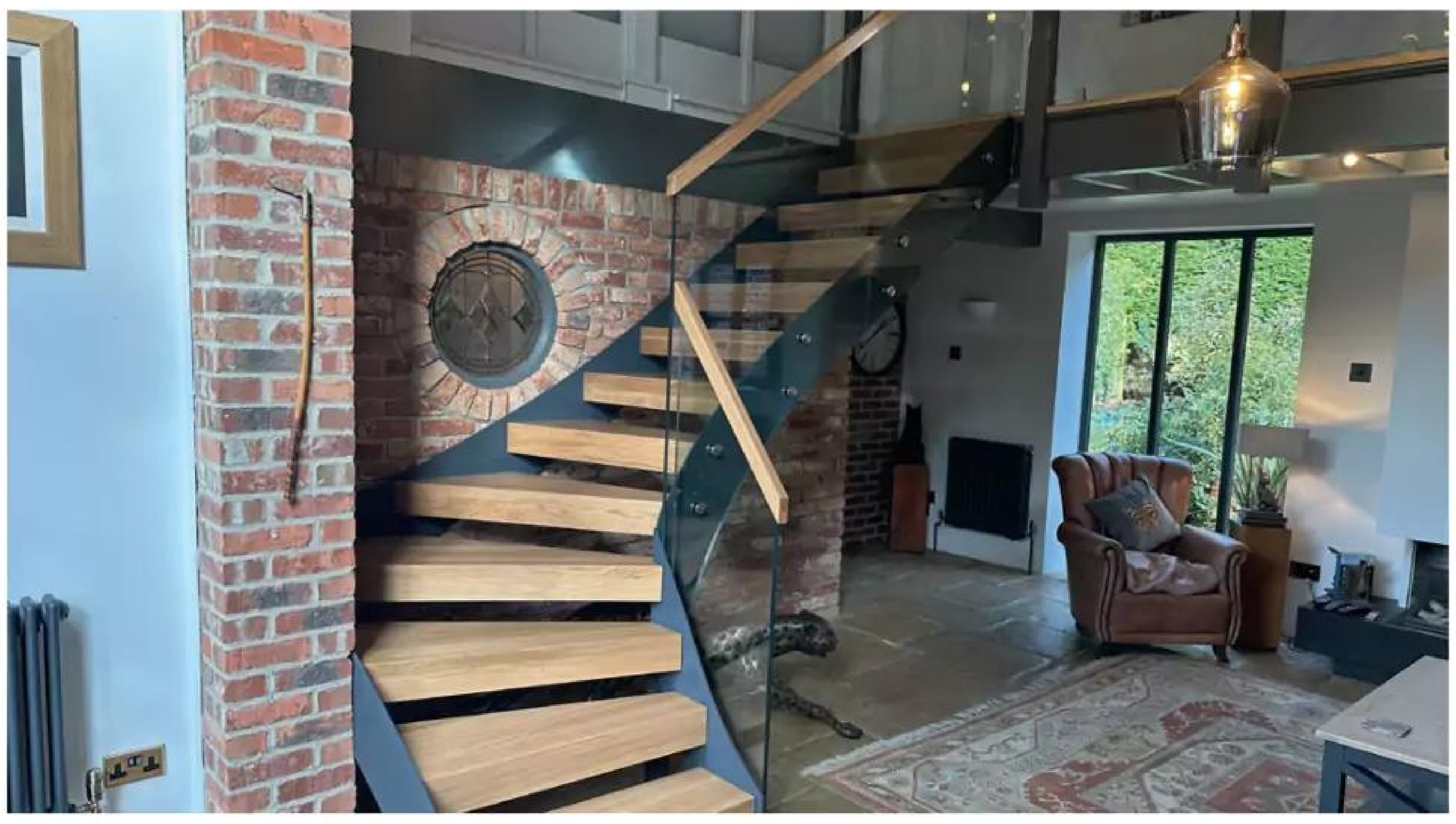

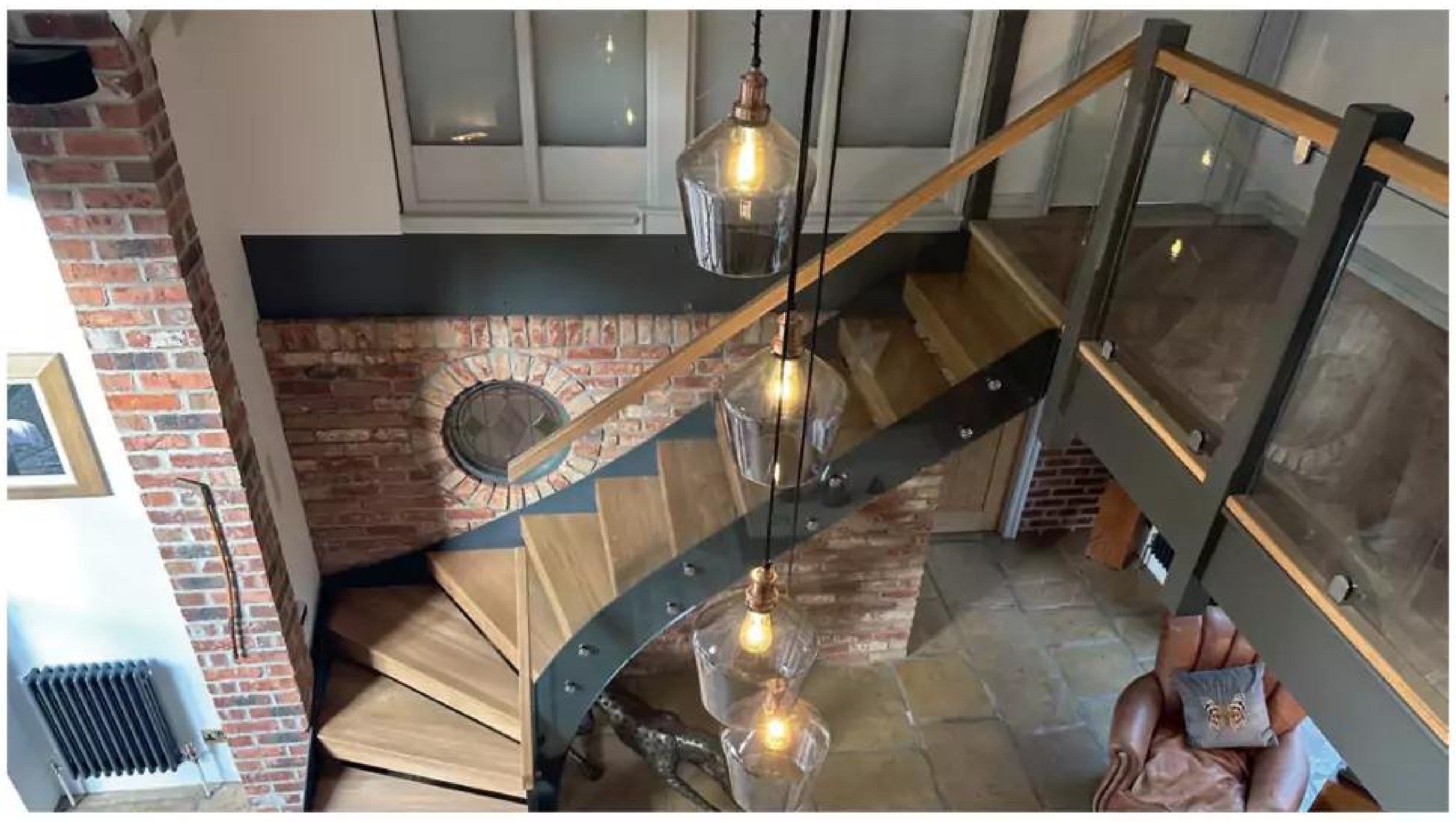

Oak and steel staircase for a Hampshire coach house conversion

Crafted to feel as though it has always belonged, this staircase pairs anthracite-grey steel stringers with the warmth of solid oak. Each 40 mm tread is shaped in an L-profile sleeper style with 20 mm downstands, giving the structure a bold, tactile presence that suits both contemporary and heritage spaces.

Instead of using standard winders, the design employs seven graduated winders to create a smooth ninety degree turn. The curved steel stringers rise like twin ribbons, following the geometry of the oak treads as they sweep past a porthole window set into the brick wall, catching the light throughout the day.

To keep the space bright, the sides are protected with 8+8 mm toughened and laminated glass, with a matching oak handrail sitting cleanly atop the panels. A complementary glass balustrade continues around the landing, opening clear views across the atrium and towards the glulam beams above.

Every rise, going and handrail height has been engineered to meet UK Building Regulations, ensuring the elegance of the design is matched by everyday comfort and practicality. A staircase built to be admired and built to last.

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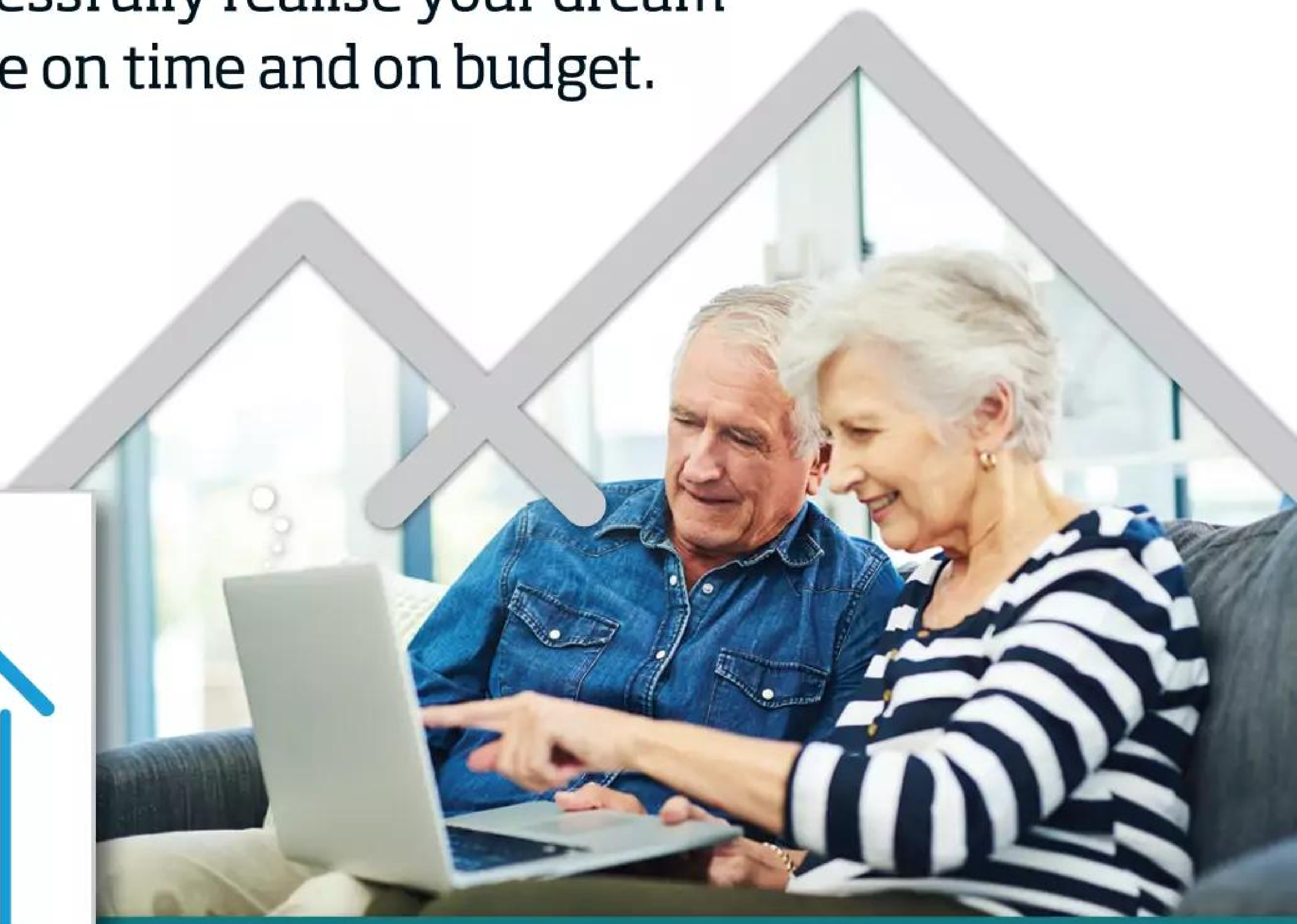

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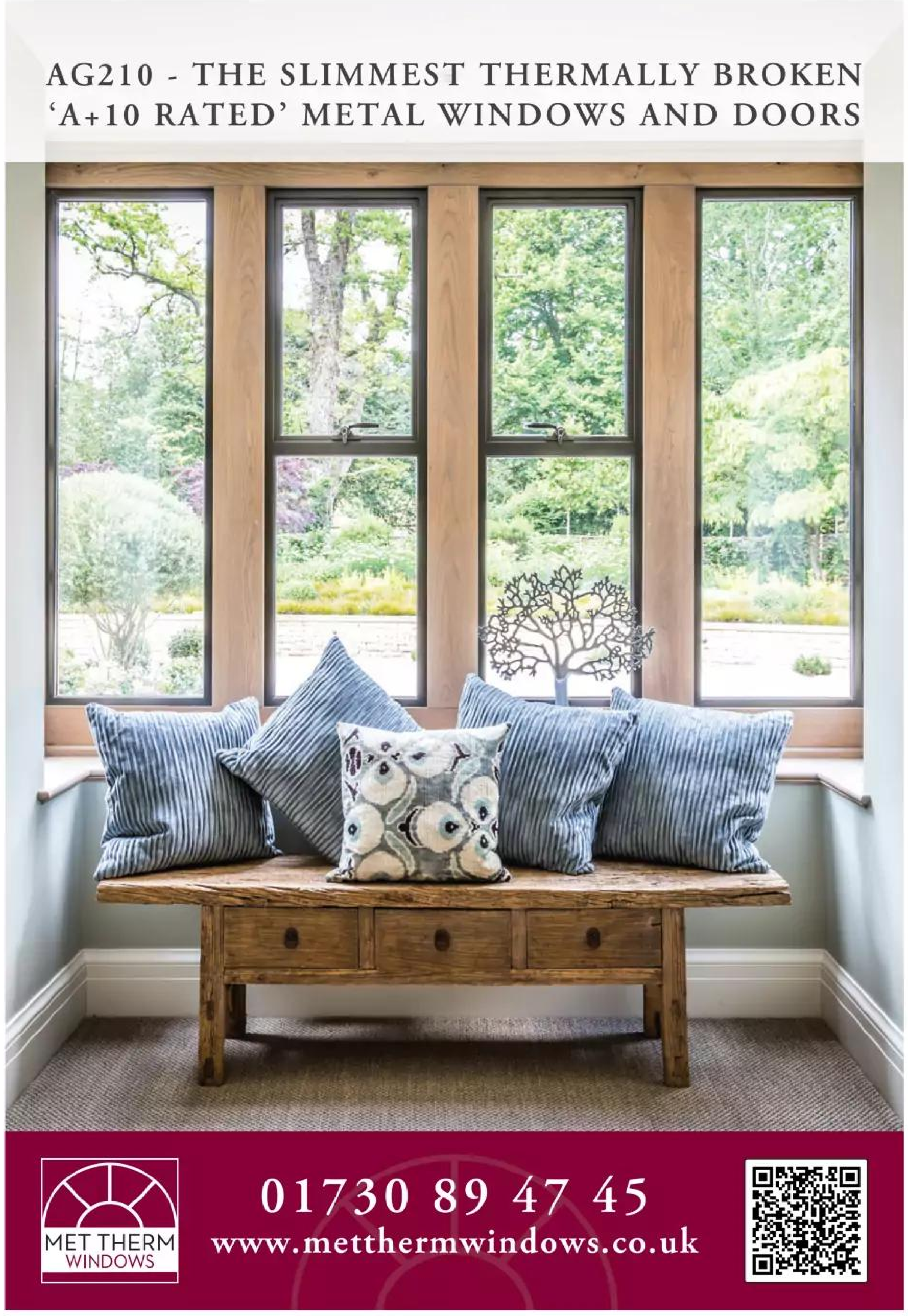

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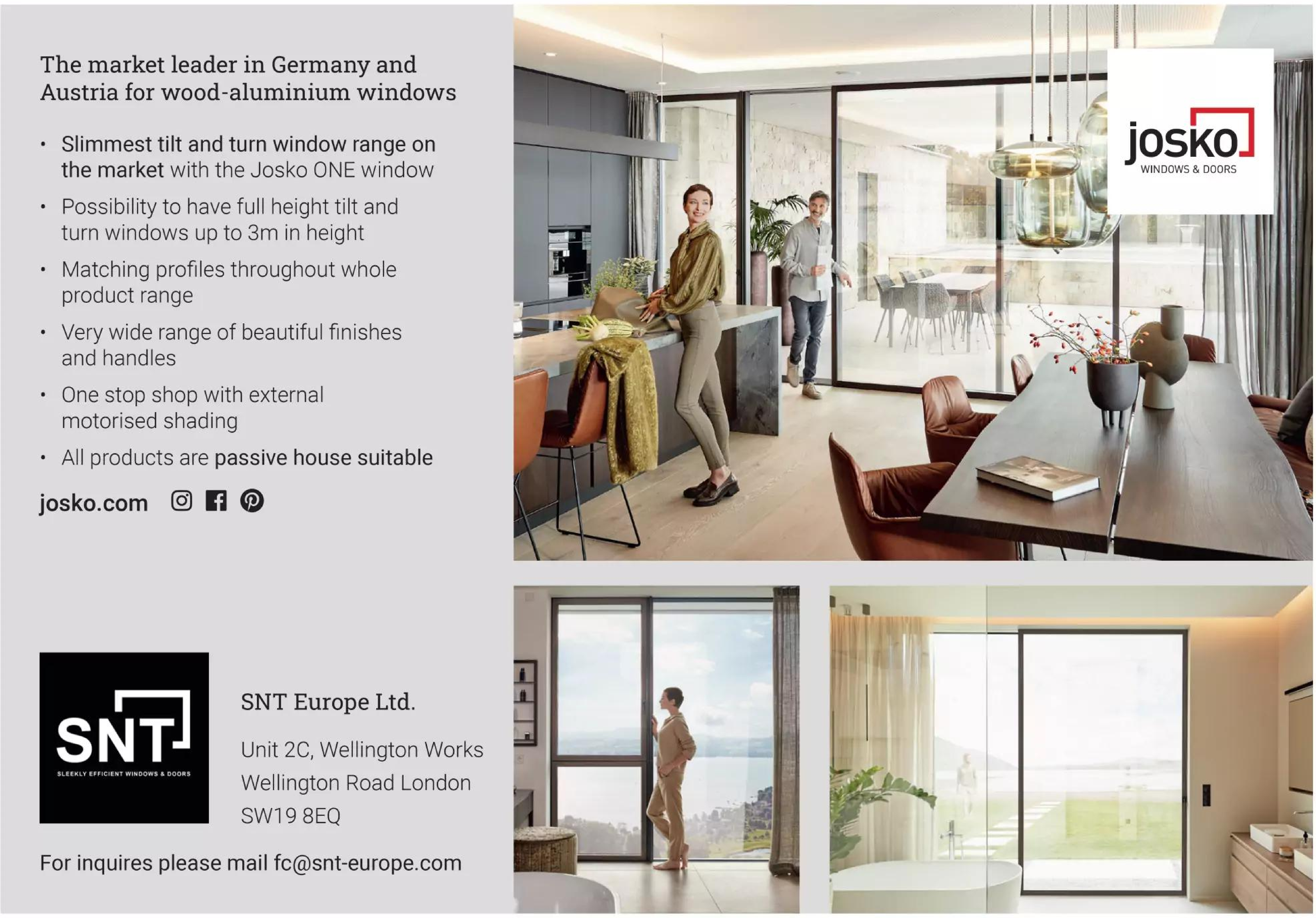

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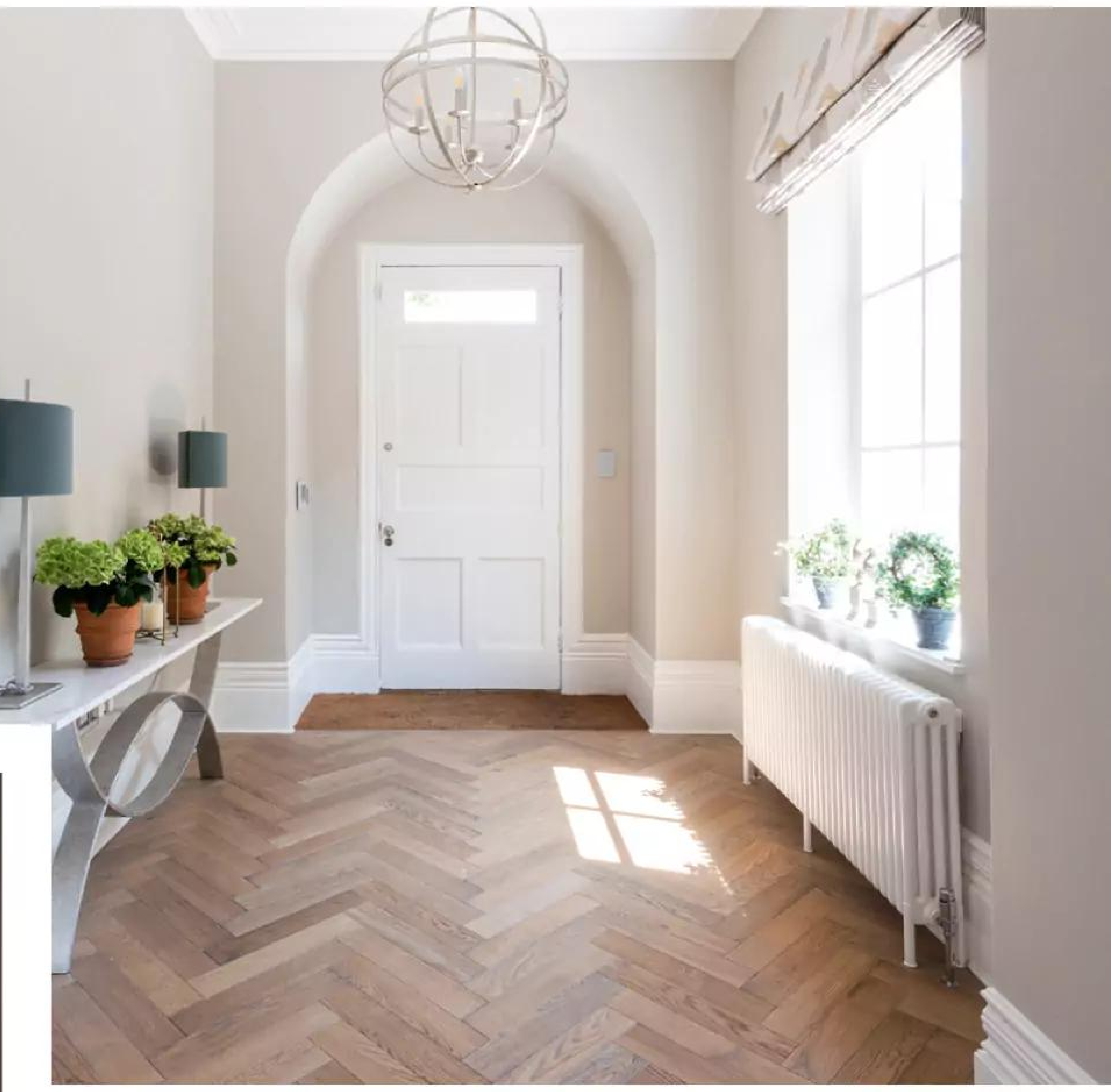

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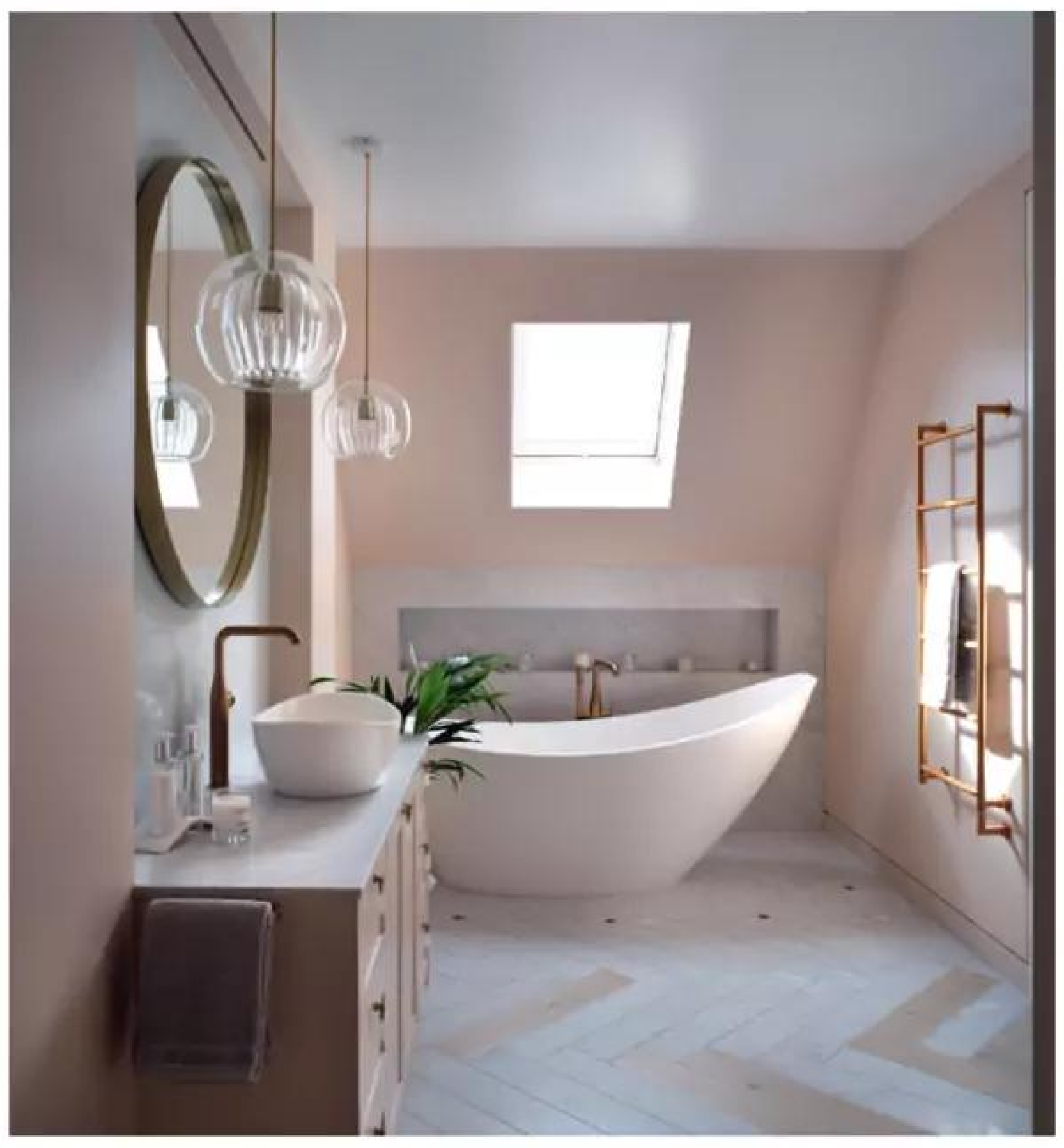

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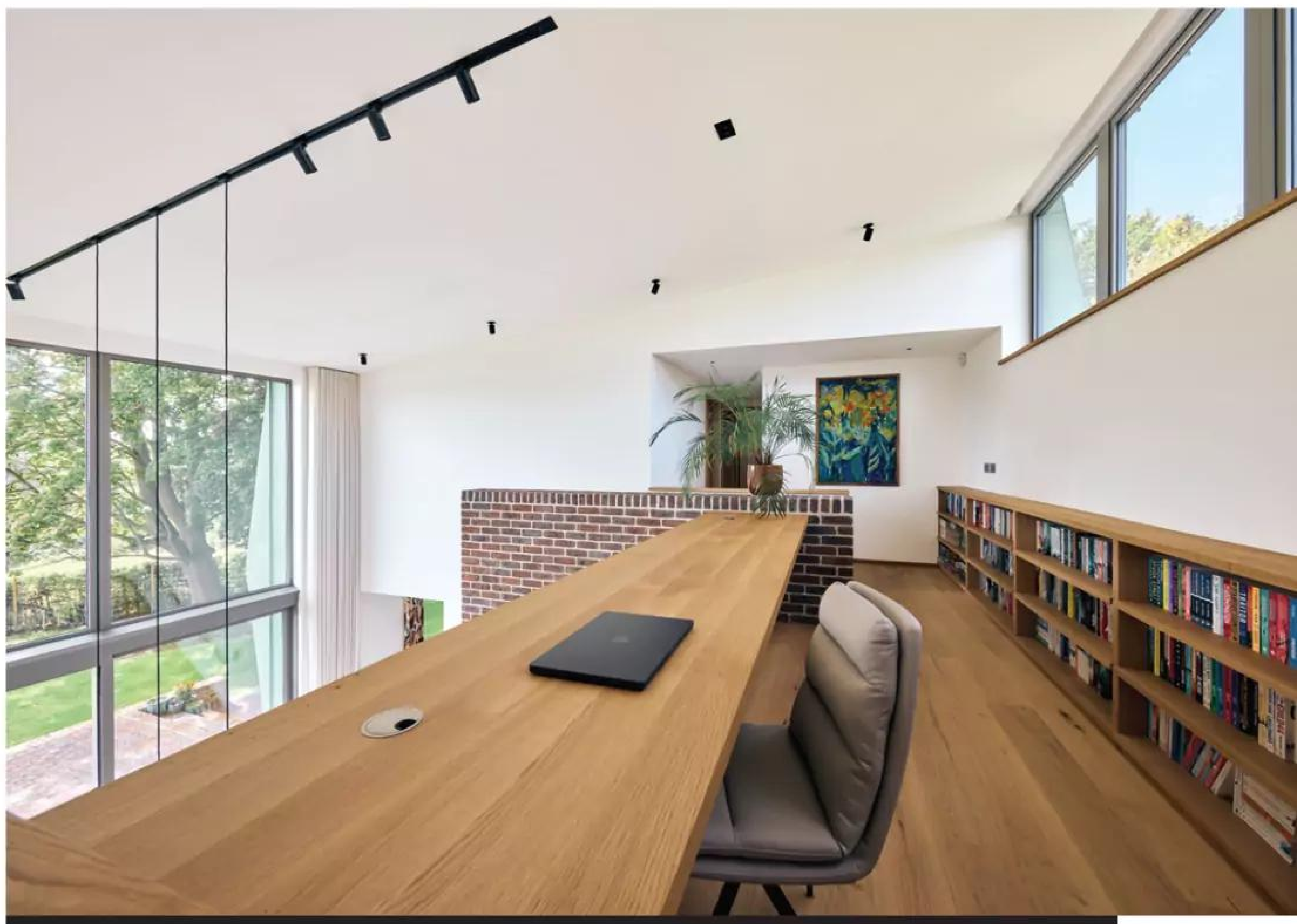
ARCHITECT'S**VIEW**

Adrian James, managing director at Adrian James Architects, discusses how to make the most out of your home's hallways and landings

Creating effective transitional spaces



Adrian James Architects created this contemporary home in Oxford. The upper landing has been cleverly designed as a workspace, making the most of the available floorspace and the impressive countryside views

Why is circulation important in a floorplan?

Having enough room to move around your house comfortably is vital because it defines how people experience and connect with the space. Walking freely between rooms creates a sense of flow that encourages exploration, comfort and openness, turning everyday movement into something more engaging, fun and meaningful. The transition from one area to another goes beyond simply opening a door – it involves a sensory shift, where changes in ceiling height, light, texture and sound subtly influence how each space feels and how you experience the home as a whole.

How can homeowners make hallways and landings more purposeful?

My top advice would be to make these spaces as generous as possible, so they can serve as more than just a throughfare to get to the next room. By incorporating elements such as bookcases, benches, tables or chairs, you can encourage people to pause, interact or relax rather than simply pass through. Even relatively small features, such as a window seat or a reading nook, can make these areas feel more connected to your everyday routine.

Introducing turns in staircases is also beneficial, as these create half landings and changes of direction which act as stopping points as you walk around your house. In order to make these spaces feel more intentional, it's about capitalising on possible encounters.

However, it's important to consider whether you would use these features. If the furniture or niches won't be used in daily life, they can feel unnecessary and take away from the clarity of the space.

Should these areas be designed differently compared to conventional rooms?

In smaller projects, such as a rustic cabin or compact home, a single flowing open space with minimal hallways can create a sense of intimacy and connection. This approach effectively allows light, air and movement to flow freely between areas without unnecessary division. It often suits informal living styles, where flexibility and visual continuity are prioritised over having more private rooms.

However, in larger buildings, corridors, stairways or landings can take on a more expressive and functional role. These areas benefit from a different design approach than sedentary rooms, as they are spaces of movement and change. They can be shaped to create rhythm and variety through shifts in floor levels, direction or ceiling heights, guiding people naturally through the building. Elements such as framed views, lighting contrasts or subtle material transitions can add layers of experience, turning circulation routes into meaningful architectural moments. Instead of simply connecting rooms, these transitional spaces can define the character of the building and influence how it feels.

What roles do lighting and views play in transitional spaces?

Sunlight and a visual connection to the outdoors are essential in hallways, as they help you stay oriented within the home and bring a sense of warmth and vitality to everyday life. By maximising natural light in these areas, you can transform them from simple passageways into uplifting, inviting spaces. As hallways often extend in multiple directions, they can capture a unique mix of light throughout the day – from soft morning sun to the warmer tones of evening. These changing qualities of light, combined with shifting garden views, create a dynamic experience that will enhance the rhythm and atmosphere of the home.

What are some common mistakes people make when planning these areas?

One of the main design errors that I often see is homeowners' desire to make staircases as open and transparent as possible. While openness can look elegant and modern, it often weakens the sense of threshold – the feeling of moving from one distinct area or level of the home to another. Without this clear transition, the experience of ascending or descending between floors can feel rather flat and continuous rather than intentional.

Instead of relying on fully-glazed or lightweight timber handrails, introducing more solid elements – such as brick or plaster walls – can create a sense of compression and release as you move. The narrower, more enclosed stair can lead to an open landing above, heightening the awareness of moving through a threshold.

Using tactile materials such as brick or textured wallpaper can also enhance a space's sensory quality. As you brush past the wall and feel its surface, you become more aware of the physical act of transition. This approach not only enhances the spatial experience but also provides a clearer separation between the more public ground floor living areas and the private first floor bedrooms.

Adrian James, managing director at Adrian James Architects, specialises in steering projects through the planning process, designing striking residential buildings which beautifully merge with their environment. For more information and to discuss your project call **01865 203267** or visit **www.adrianjames.com**

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